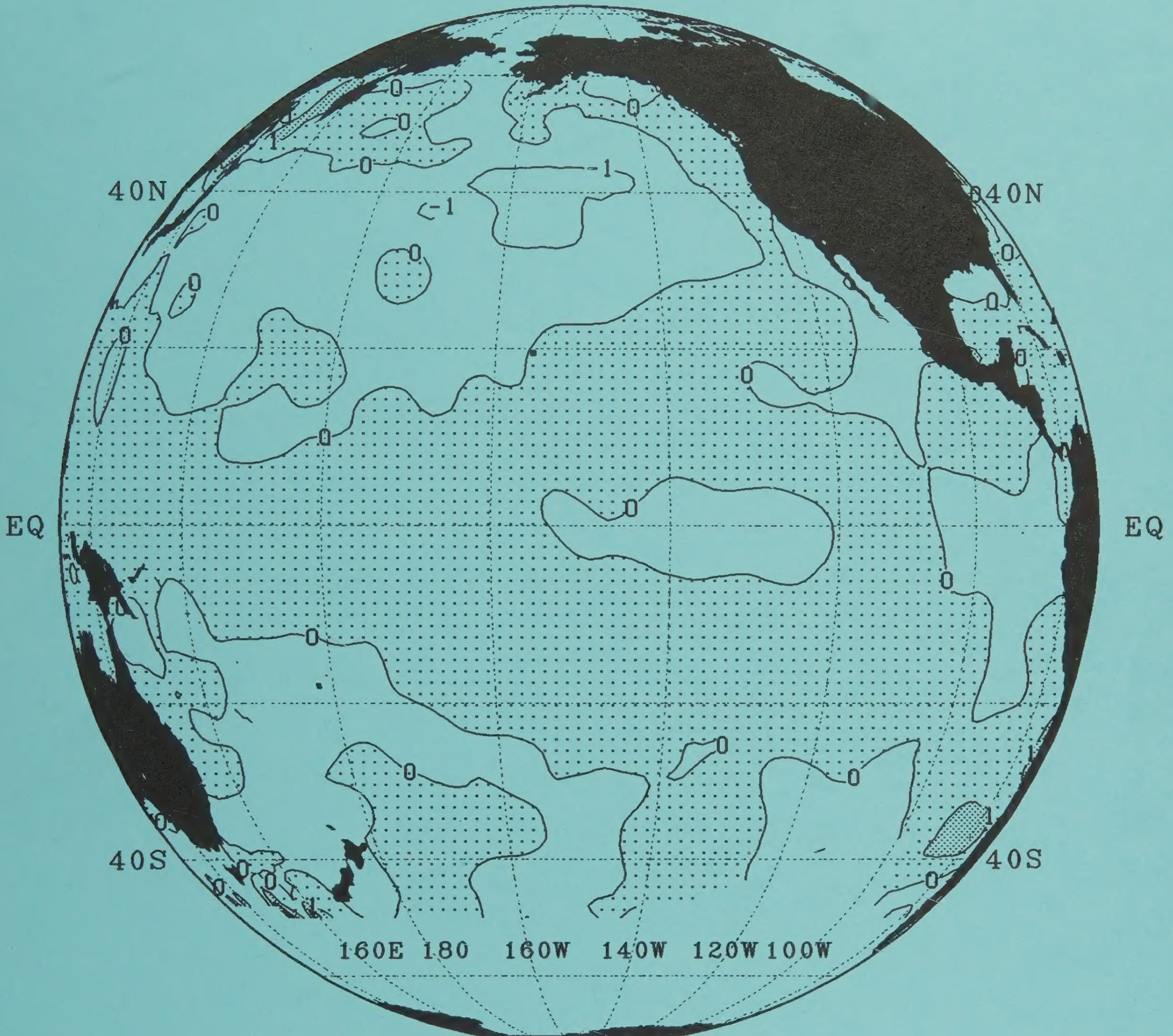
気象庁海洋月報

Monthly Ocean Report

June 1995 (No. 30)



El Niño Monitoring Center
Japan Meteorological Agency

気象庁海洋気象部海洋課
エルニーニョ監視センター

平成7年6月

気象庁海洋月報は、気象庁海洋気象部海洋課エルニーニョ監視センターで作成されています。
本月報に関する問い合わせは、

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Monthly Ocean Report is prepared by the El Niño Monitoring Center, Oceanographical Division, Marine Department, Japan Meteorological Agency.

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表紙は、1995年6月の太平洋の月平均海面水温偏差図です。
陰影部は、平年より高温の海域を示しています。

The figure on the front cover shows the monthly mean SST anomalies for June 1995 in the Pacific Ocean.
Areas of positive anomalies are shaded.

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海況の特徴（1995年6月）

太平洋の海況

太平洋赤道域の海面水温は、ペルーの沖合で平年より0.5℃～1℃低かったほかは、155°W～120°Wを除いて正偏差域が広がっていた。エルニーニョ監視海域（4°S～4°N、150°W～90°W）の海面水温偏差は、-0.1℃と平年並となった（第1表、第1図、第6図）。

気象庁の海洋気象観測船「啓風丸」は、本年6月に137°E線上を日本近海から赤道域にかけて海洋観測を行った。その観測によれば、4°N付近の28℃以上の表層の暖水層の厚さは、1989年以来の同時期の観測の中で最も厚く、100m深まで達していた（図A）。

北太平洋では、30°N～45°Nの170°Wから140°Wにかけて平年より1℃以上低かった（第6図）。

日本近海の海況

日本近海の海面水温は、日本海北部及びオホーツク海紀を除いて全般に平年より低く、特に日本海中部及び北海道南東沖では1℃以上低かった（第24図）。

本年4月中旬に九州南東で発生した黒潮の小蛇行は東進し、6月中旬は四国沖、下旬には紀伊水道沖に達した。東海沖の黒潮は5月に引き続き32.5°N，140°E付近まで南下した後、伊豆諸島の東側を北上していた（第27図）。

本州東方の親潮系の冷水（深さ100mで5℃以下）は、沿岸寄りの分枝は40.5°N，143.5°Eまで、沖合の分枝は38.0°N，145.5°Eまで、それぞれ達していた（第26図）。

熱帯の気象

対流圏上層の大規模な発散の中心は、平年より20度西のインドネシア付近に存在した。中国南部から日本の南にかけて対流活動が平年より活発となり、フィリピン付近では対流活動が平年より弱い状態が持続した。赤道付近の850hPaの東西風は、太平洋西部から中部にかけて東風偏差となった。インド洋域のソマリジェットは、平年より弱かった。南方振動指数（SOI）は、平年並（-0.1）となった（第1表、第3～5図、第12図）。　［気象庁長期予報課提供］

HIGHLIGHTS June 1995

Pacific

Sea surface temperatures (SSTs) in the equatorial Pacific were 0.5-1°C below normal off Peru. Positive SST anomalies prevailed west of 110°W except from 155°W to 120°W. The SST index for region B (Fig. 1) was -0.1 (Table 1 and Figs. 1 and 6) .

According to the oceanographic observations carried out in June 1995 by RV Keifu Maru of the JMA from 33°N to 3°N along the meridian of 137°E, surface warm water (above 28°C) around 4°N was about 100m in depth and the thickest among its observations in May/June since 1989 (Fig. A).

In the North Pacific, SSTs were more than 1°C below normal between 30°N and 45°N from 170°W to 140°W (Fig. 6).

Seas adjacent to Japan

SSTs in the seas adjacent to Japan were generally below normal, especially in the central part of the Japan Sea and southeast of Hokkaido where SSTs were more than 1°C below normal. Positive SST anomalies were found in the northern part of the Japan Sea and the Sea of Okhotsk (Fig. 24).

The small meander in the Kuroshio which appeared southeast of Kyushu in the middle of April shifted to a position off Shikoku in the middle of June, off the Kii Channel late in June. The southernmost point of the Kuroshio path off Tokai was near 32.5°N, 140°E. From that point it flowed northward east of the Izu Islands (Fig. 27).

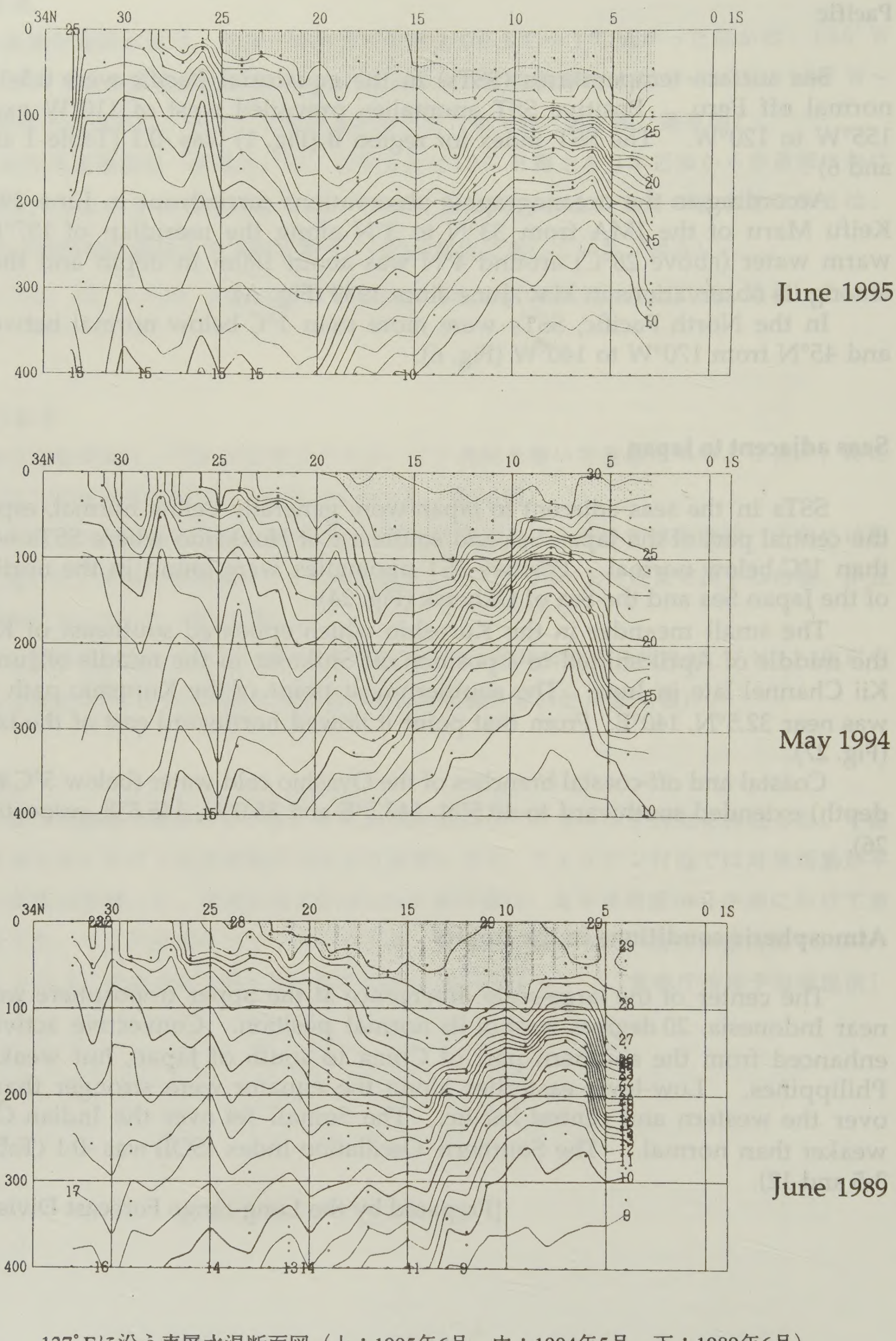
Coastal and off-coastal branches of the Oyashio cold water (below 5°C at a 100 m depth) extended southward to 40.5°N, 143.5°E and 38.0°N, 145.5°E, respectively (Fig. 26).

Atmospheric conditions in the tropics

The center of the large-scale divergence at the upper troposphere was located near Indonesia, 20 degrees west of its normal position. Convective activities were enhanced from the southern part of China to south of Japan, but weak over the Philippines. Low-level easterlies along the equator were stronger than normal over the western and central Pacific. The Somali Jet over the Indian Ocean was weaker than normal. The Southern Oscillation Index (SOI) was -0.1 (Table 1, Figs. 3-5 and 12).

[Prepared by the Long-range Forecast Division, JMA]

Depth-Latitude Section of Temperature along 137°E



図－A　137゜Eに沿う表層水温断面図（上：1995年6月、中：1994年5月、下：1989年6月）

Fig. A　Depth-latitude section of ocean temperature along 137°E for June 1995 (top), May 1994 (middle) and June 1989 (bottom). Contour interval is 1°C. Values greater than 28°C are shaded.

DATE	SEA SURFACE TEMPERATURE AND ANOMALY (°C)								SEA LEVEL ANOMALY (cm)					
	Region D 14N-Eq. 130E-150E		Region A 4N-4S 160E-150W		Region B 4N-4S 150W-90W		Region C Eq.-10S 90W-80W		Yap 10N,138E	Rabaul 4S,152E	Majuro 7N,171E	Tarawa 1N,173E	Christ-mas 2N,157W	Santa Cruz 1S, 90W
JUL 94	29.2	0.0	29.2	+0.7	25.1	-0.1	21.2	-0.4	9	2	-1	9	4	0
AUG 94	29.3	+0.2	29.4	+1.0	24.6	0.0	20.6	0.0	1	0	0	-	7	-1
SEP 94	29.1	-0.1	29.1	+0.8	24.6	0.0	19.9	-0.4	-5	-	0	14	4	1
OCT 94	29.3	0.0	29.2	+0.8	25.3	+0.7	21.6	+0.9	0	-	-	10	9	4
NOV 94	29.3	+0.1	29.5	+1.1	25.6	+1.0	22.4	+0.9	5	2	-5	-	7	10
DEC 94	28.8	-0.1	29.4	+1.2	26.0	+1.1	23.6	+1.0	-1	2	-5	-	6	9
JAN 95	28.3	-0.2	29.0	+1.0	26.2	+0.8	25.7	+1.4	-3	-2	2	7	8	7
FEB 95	28.2	-0.1	28.9	+0.9	26.8	+0.6	26.1	+0.4	-7	-2	5	5	2	5
MAR 95	28.2	-0.2	28.8	+0.7	26.9	0.0	25.8	-0.1	2	6	6	2	0	-2
APR 95	28.7	-0.1	28.8	+0.6	26.9	-0.2	24.6	-0.5	-7	10	11	1	-3	-11
MAY 95	29.2	+0.1	29.0	+0.5	26.2	-0.4	23.1	-0.8	-3	6	6	4	2	-8
JUN 95	29.6	+0.3	29.0	+0.5	26.0	-0.1	22.2	-0.5						

第１表（ａ）　エルニーニョ監視指数

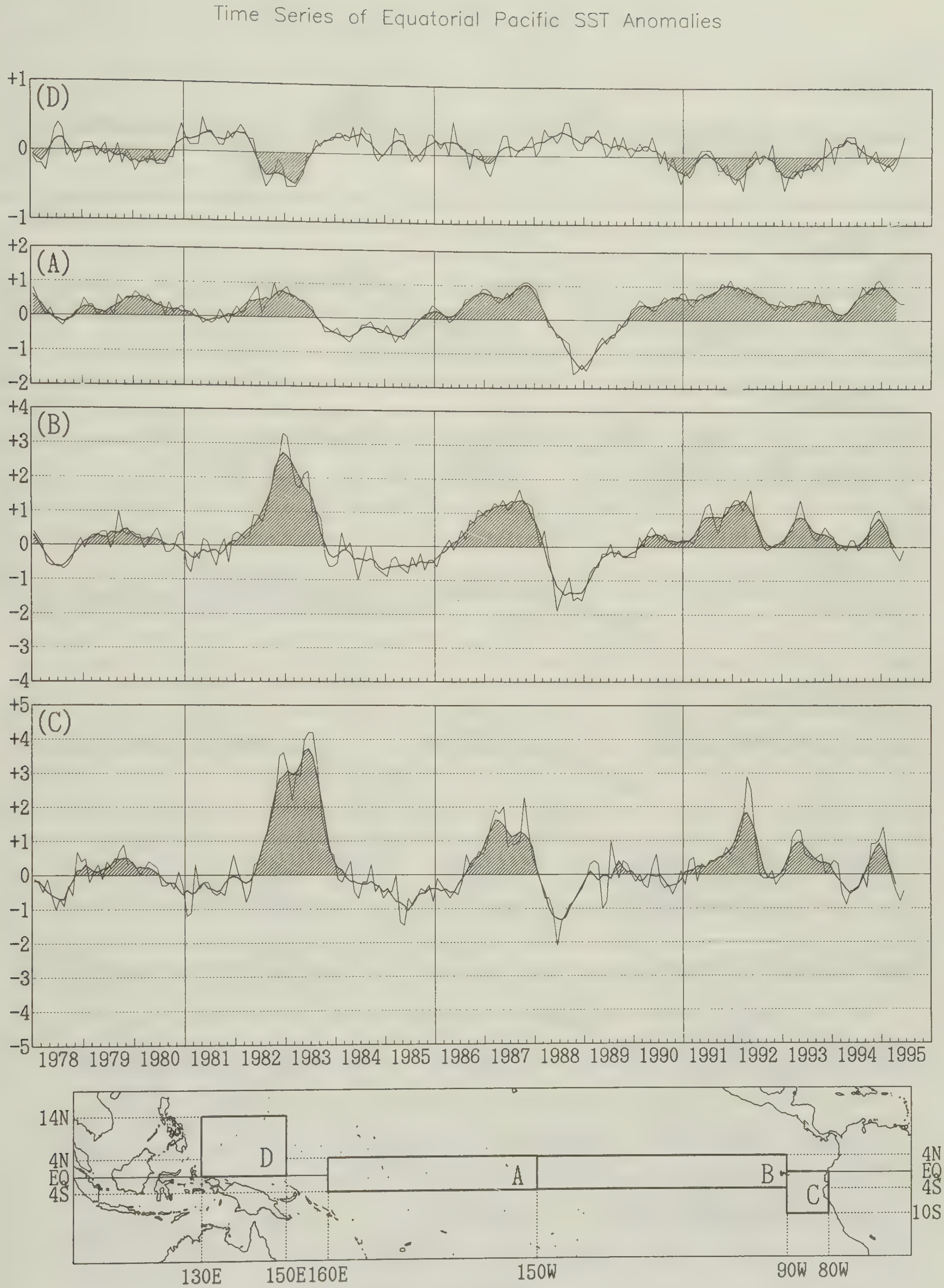
Table 1 (a)　El Niño monitoring indices. Data sources are the El Niño Monitoring Center of JMA for the sea surface temperature and anomaly and SOC for ISLP-Pac, Department of Oceanography, University of Hawaii for the sea level anomaly.

DATE	SOI	SEA LEVEL PRESSURE ANOMALIES		HIGH CLOUD AMOUNT INDEX			EQUATORIAL ZONAL WIND INDEX				
		TAHITI 17°33'S, 149°37'W	DARWIN 12°24'S, 130°52'E	HCLD-PH 20N-10N 110E-140E	HCLD-MC 5N-5S 110E-135E	HCLD-DL 5N-5S 170E-170W	U200-IN 5N-5S 80E-100E	U200-CP 5N-5S 180 -125W	U850-WP 5N-5S 160E-175W	U850-CP 5N-5S 170W-135W	U850-EP 5N-5S 130W-100W
JUL 94	-1.6	-1.5	1.0	3.5	-1.1	-0.5	-1.2	0.4	0.1	-0.1	-1.3
AUG 94	-1.8	-0.7	2.0	-0.9	-1.1	0.4	-0.6	0.0	0.6	0.0	-1.8
SEP 94	-1.6	-1.5	1.5	0.2	-1.1	1.4	-0.9	0.1	0.4	0.3	0.9
OCT 94	-1.5	-1.1	1.2	-0.6	-1.9	0.2	1.1	-0.9	0.9	1.2	0.8
NOV 94	-0.6	-0.2	0.9	-3.4	-1.3	1.9	0.5	-0.3	1.2	1.2	1.6
DEC 94	-1.2	-0.3	1.8	-0.7	-0.2	2.6	0.5	0.1	1.2	-0.2	0.1
JAN 95	-0.4	-0.3	0.6	-1.1	-0.4	1.2	-0.4	-0.2	-0.3	-0.6	0.3
FEB 95	-0.2	0.6	1.1	-0.7	-0.3	0.3	-0.8	-0.5	-0.4	0.1	-0.1
MAR 95	0.4	0.3	-0.5	-0.7	0.3	-0.3	-0.2	-0.1	-0.7	-0.4	-0.3
APR 95	-1.4	-1.6	0.0	-1.1	-0.2	-0.6	0.7	0.0	0.0	-0.2	0.1
MAY 95	-1.1	-0.7	0.6	0.3	-1.2	-0.1	-0.9	0.1	0.0	-0.1	0.2
JUN 95	-0.1	0.3	0.4	-1.8	-0.4	-0.7	0.2	0.2	-0.9	-0.4	0.6

第１表（ｂ）　エルニーニョ監視指数（続き）

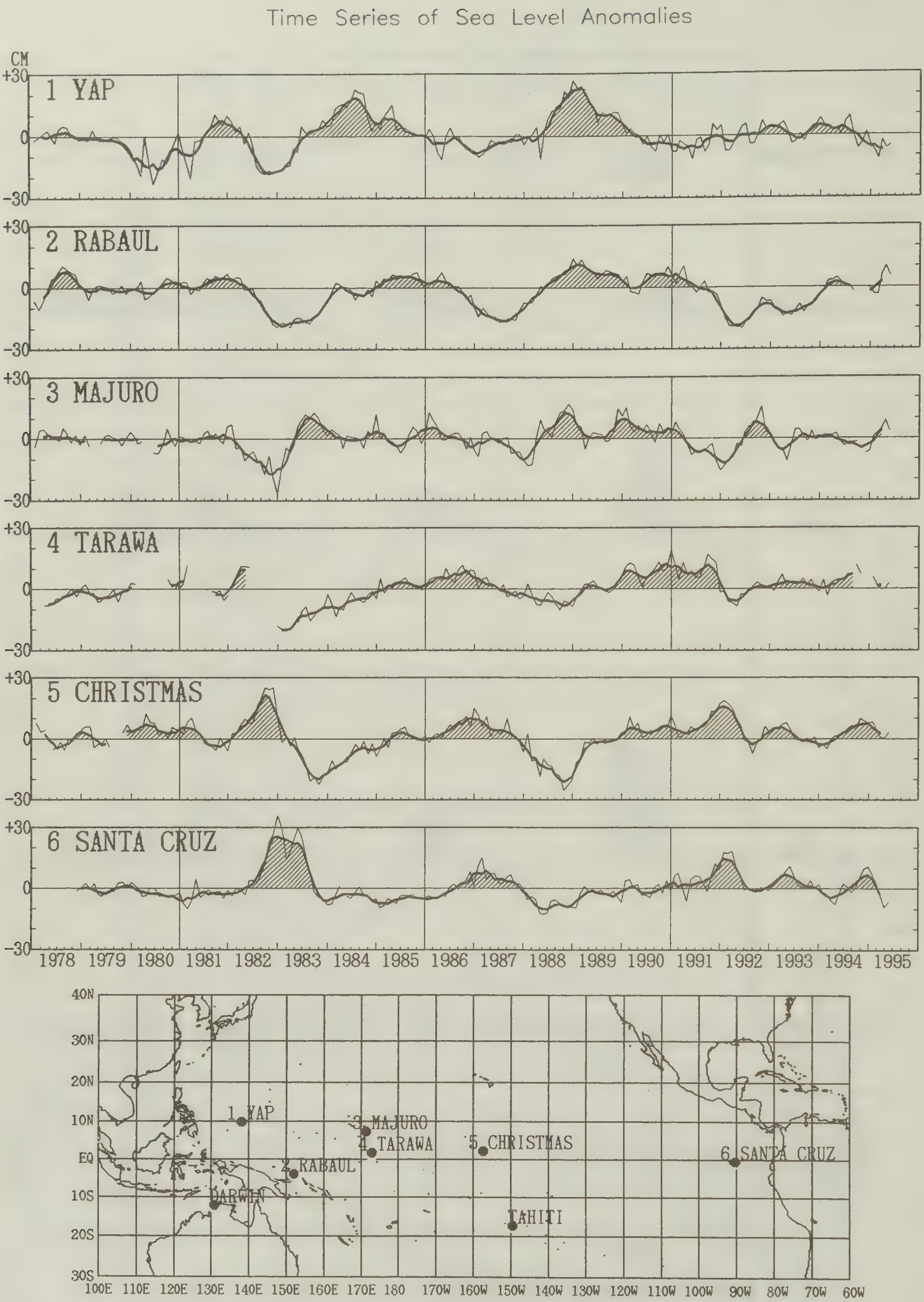
Table 1 (b) El Niño monitoring indices (continued).

Data sources are the Long-range Forecast Division of JMA for the atmospheric conditions.



第1図　太平洋赤道域の海面水温偏差時系列図

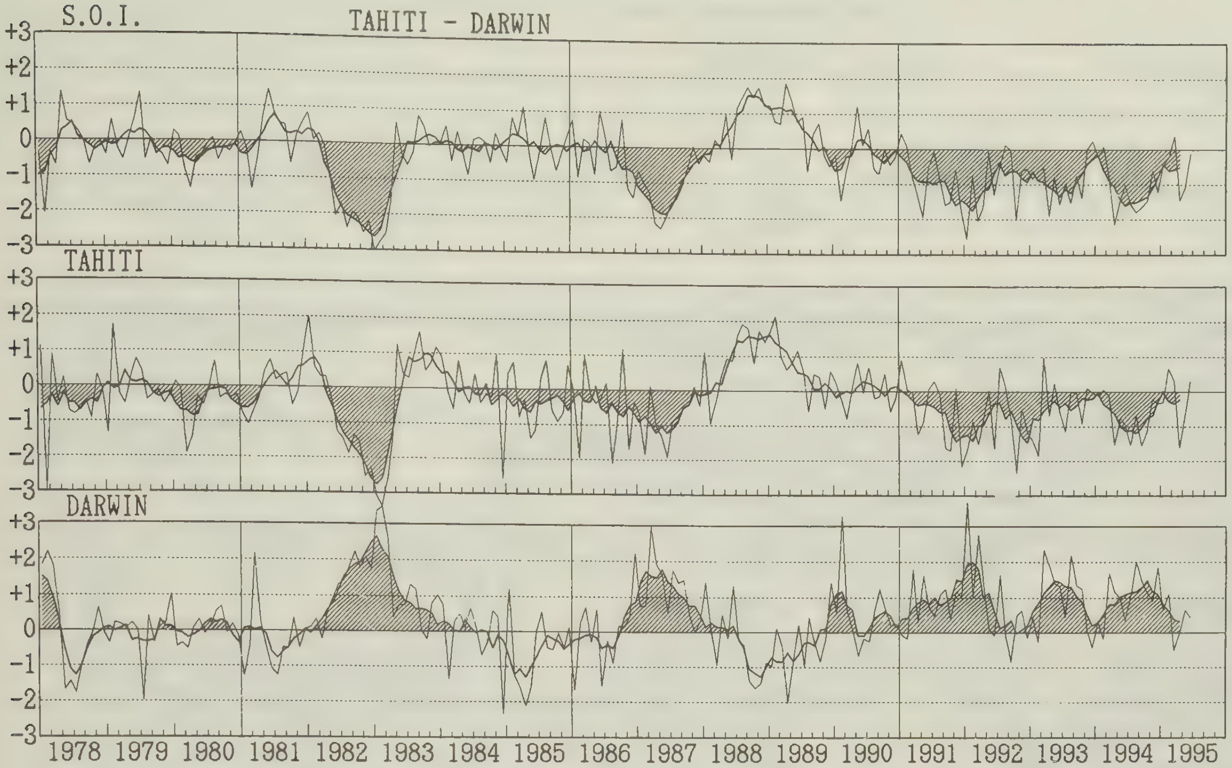
Fig.1 Time series of monthly mean SST anomalies (° C) in the equatorial Pacific Ocean for the areas indicated at the bottom.
Thin lines show the monthly means and thick lines their 5-month running means. Positve anomalies (A, B, C) and negative anomalies (D) are shaded. Anomalies are computed from the JMA climatology (1961-1990).



第2図　太平洋月平均海面水位偏差時系列図

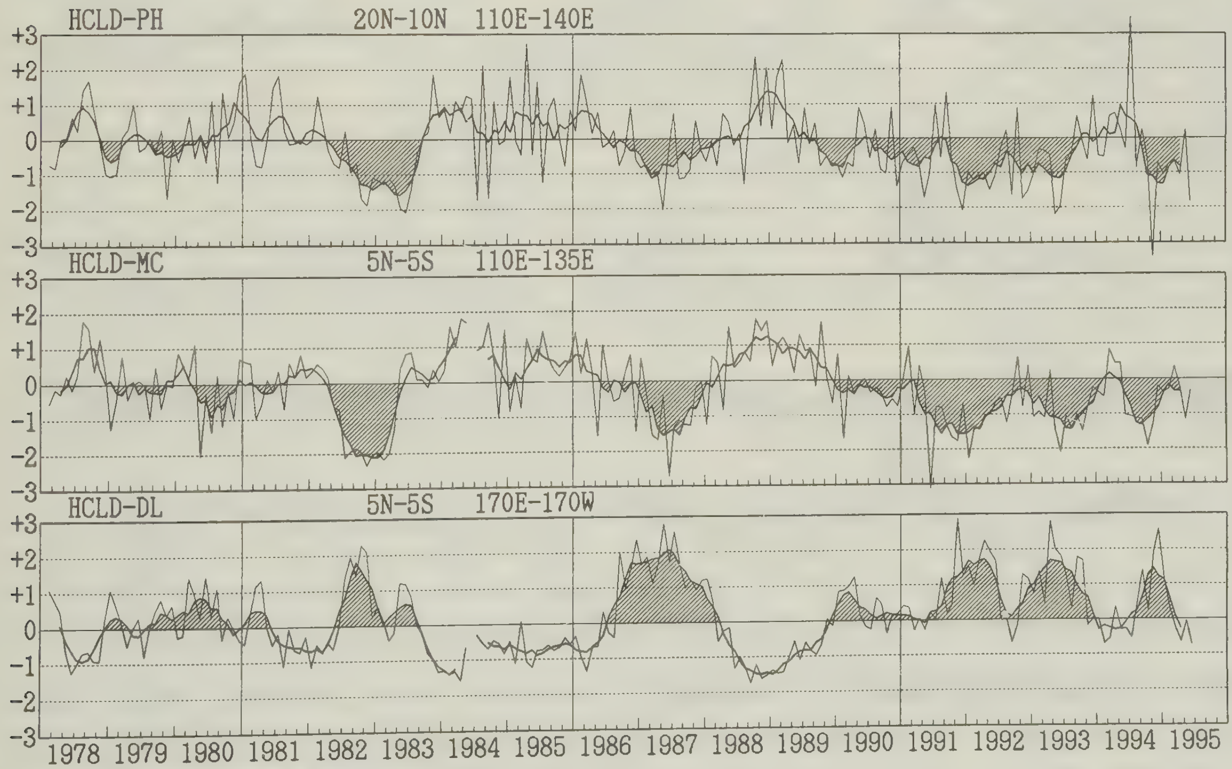
Fig.2 Time series of sea level anomalies computed from 1976–1990 monthly mean values obtained from the stations indicated at the bottom. Thin lines show the monthly mean and thick lines their 5–month running means. Positive anomalies are shaded.

Time Series of SOI and High-Cloud Amount Index



第3図　南方振動指数及び海面気圧偏差時系列図

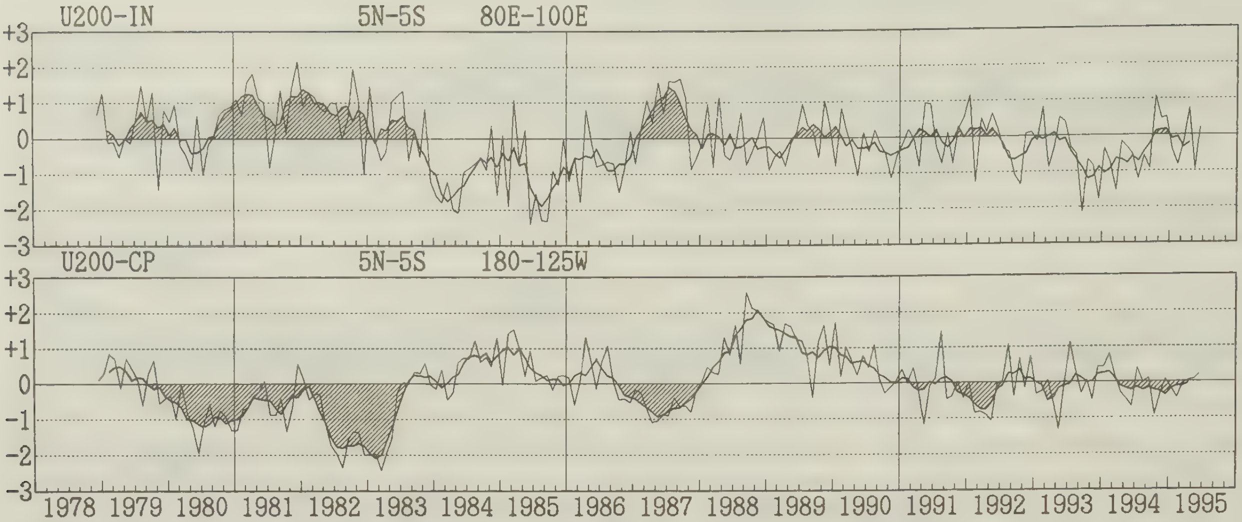
Fig.3 Time series of the Southern Oscilation Index (top) and monthly mean sea level pressure standardized anomalies at Tahiti (middle) and Darwin (bottom). Thin lines show the monthly mean and thick lines their 5-month running means. Negative anomalies (top, middle) and posotive anomalies (bottom) are shaded. Normals and standard deviations are computed from 1961-1990 base periods. Data sources are the Long-range Forecast Division of JMA.



第4図　月平均上層雲量指数時系列図

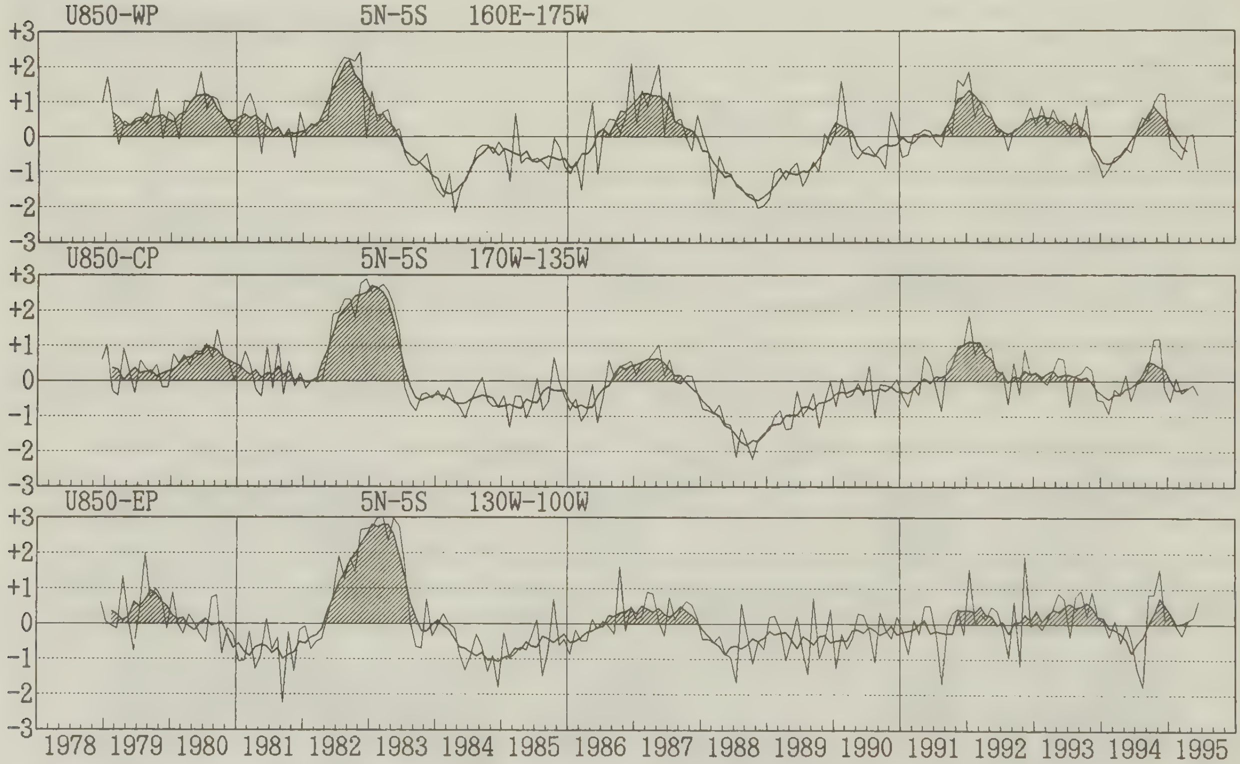
Fig.4 Time series of high-cloud amount index averaged over the area 20° N-10° N, 110° E-140° E (top), 5° N-5° S, 110° E-135° E (middle), and 5° N-5° S, 170° E-170° W (bottom). Thin lines show the monthly mean and thick lines their 5-month running means. Negative anomalies (top, middle) and positive anomalies (bottom) are shaded. Normals and standard deviations are computed from 1978-1990 base periods. Data sources are the Long-range Forecast Division of JMA.

Time Series of Zonal Wind Index



第5図-1　赤道域東西風指数(200ｈＰａ)時系列図

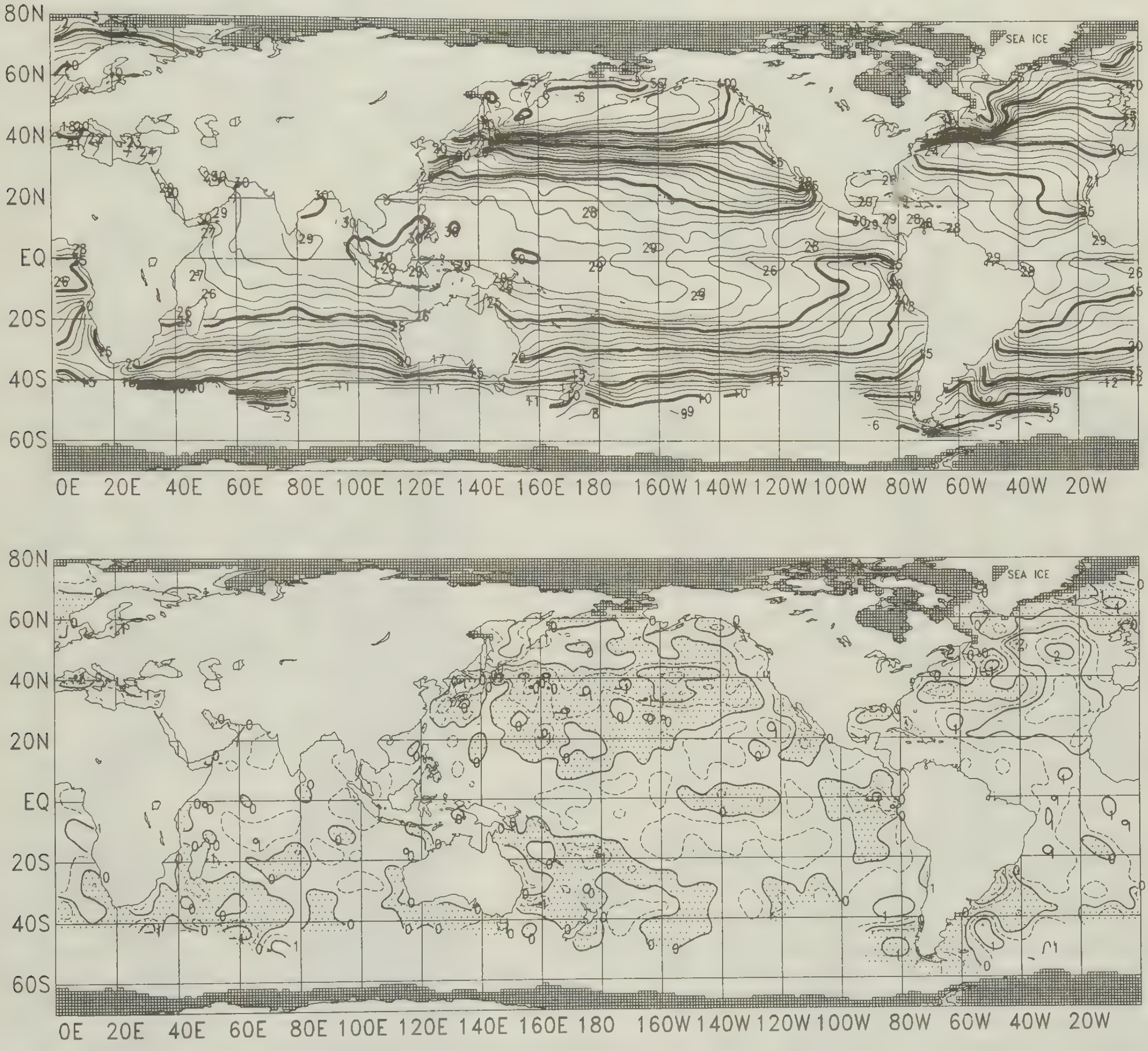
Fig.5−1 Time series of 200hPa zonal wind index averaged over the areas of 5° N−5° S, 80° E−100° E (top), and 5° N−5° S, 180° −125° W (bottom).
Thin lines show the monthly mean and thick lines their 5−month running means.
Positive anomalies (top) and negative anomalies (bottom) are shaded.
Normals and standard deviations are computed from 1979−1990 base periods.
Data sources are the Long−range Forecast Division of JMA.



第5図-2　赤道域東西風指数(850ｈＰａ)時系列図

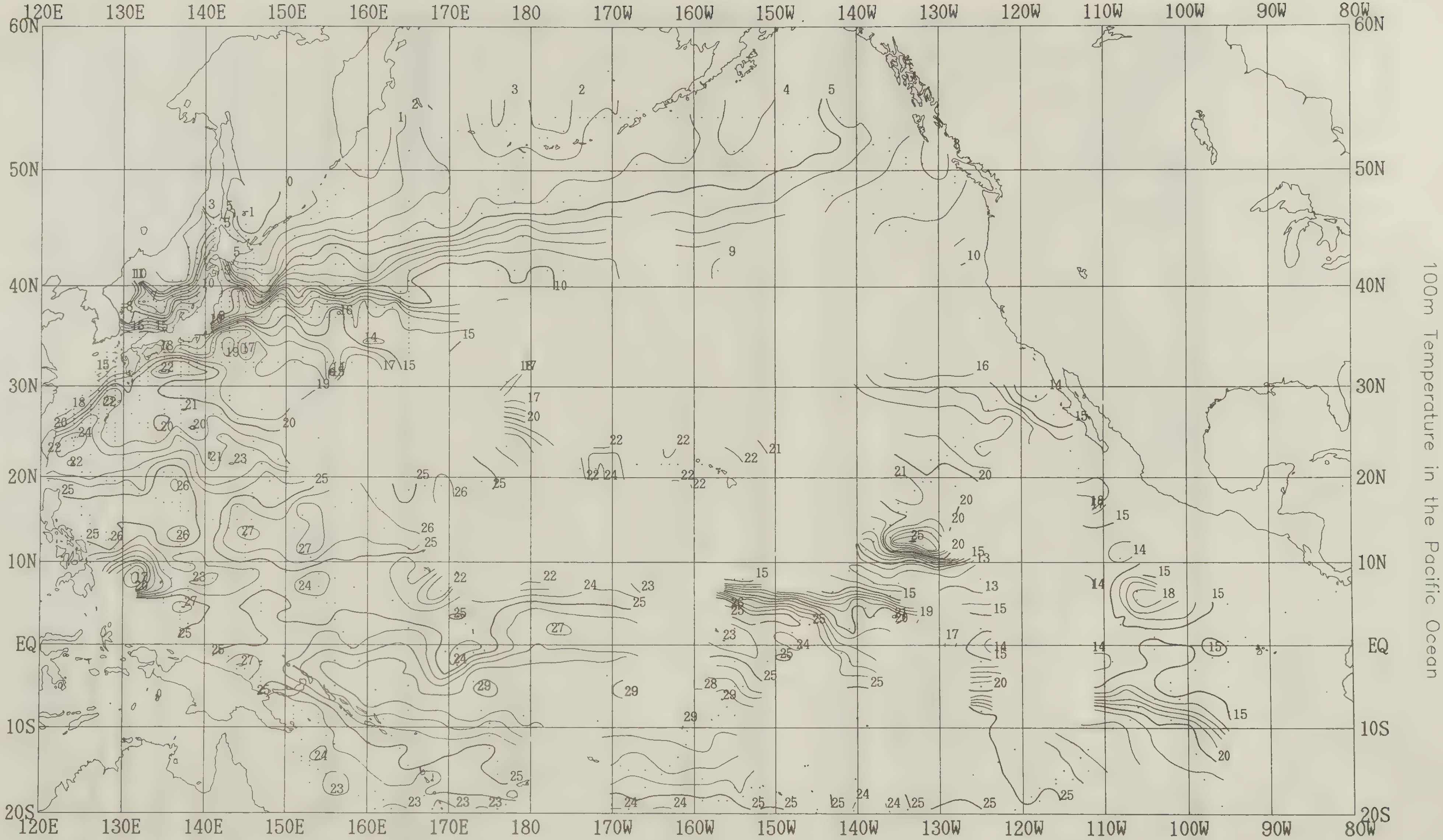
Fig.5−2 Time series of 850hPa zonal wind index averaged over the areas of 5° N−5° S, 160° E−175° W (top), 5° N−5° S, 170° W−135° W (middle), and 5° N−5° S, 130° W−100° W (bottom). Thin lines show the monthly mean and thick lines their 5−month running means. Positive anomalies are shaded.
Normals and standard deviations are computed from 1979−1990 base periods.
Data sources are the Long−range Forecast Division of JMA.

SST & Anomalies in the Global Ocean



第6図　全球月平均海面水温図（上）及び偏差図（下）（1995年 6月）

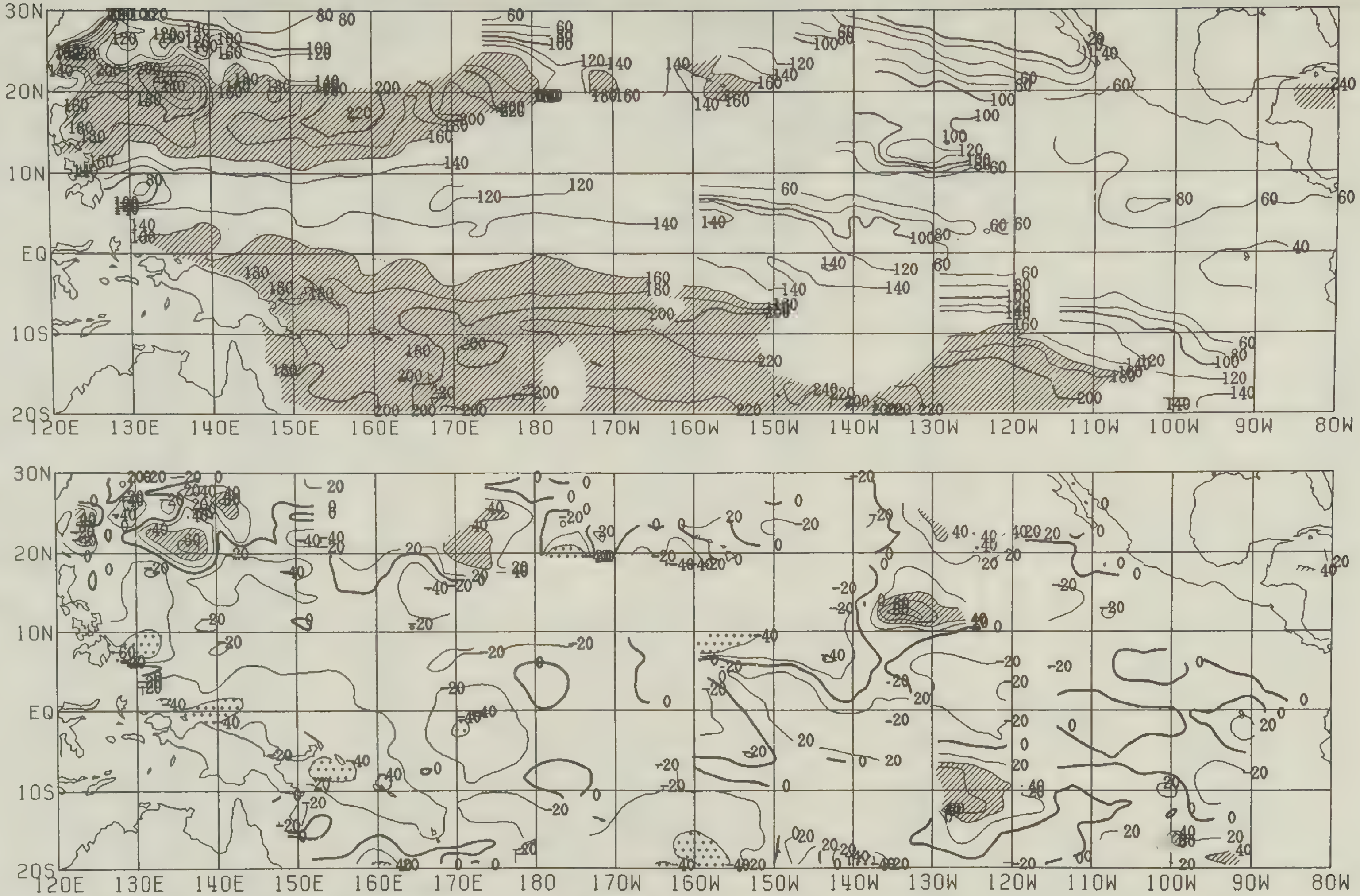
Fig.6 Monthly mean sea surface temperature over the global ocean (top) and anomalies (bottom) for JUN 1995. Anomalies are computed from the JMA climatology (1961–1990) (Marine Department of JMA, 1991, Climatic charts of sea surface temperatures of the western North Pacific and the global ocean). Contour interval is 1°C (top) and additional anomaly contours of ±0.5°C are shown as broken lines. Negative anomalies are spotted. Maximum coverage of sea ice is shaded. Data sources for sea ice are U.S. National Ice Center (polar regions) and JMA (the Sea of Okhotsk).



第7図　太平洋表層水温(深さ100m)図 (1995年 6月)

Fig.7 Subsurface (100m) temperatures in the Pacific Ocean for JUN 1995 . Contour interval is 1° C. Observation points are denoted by dots.

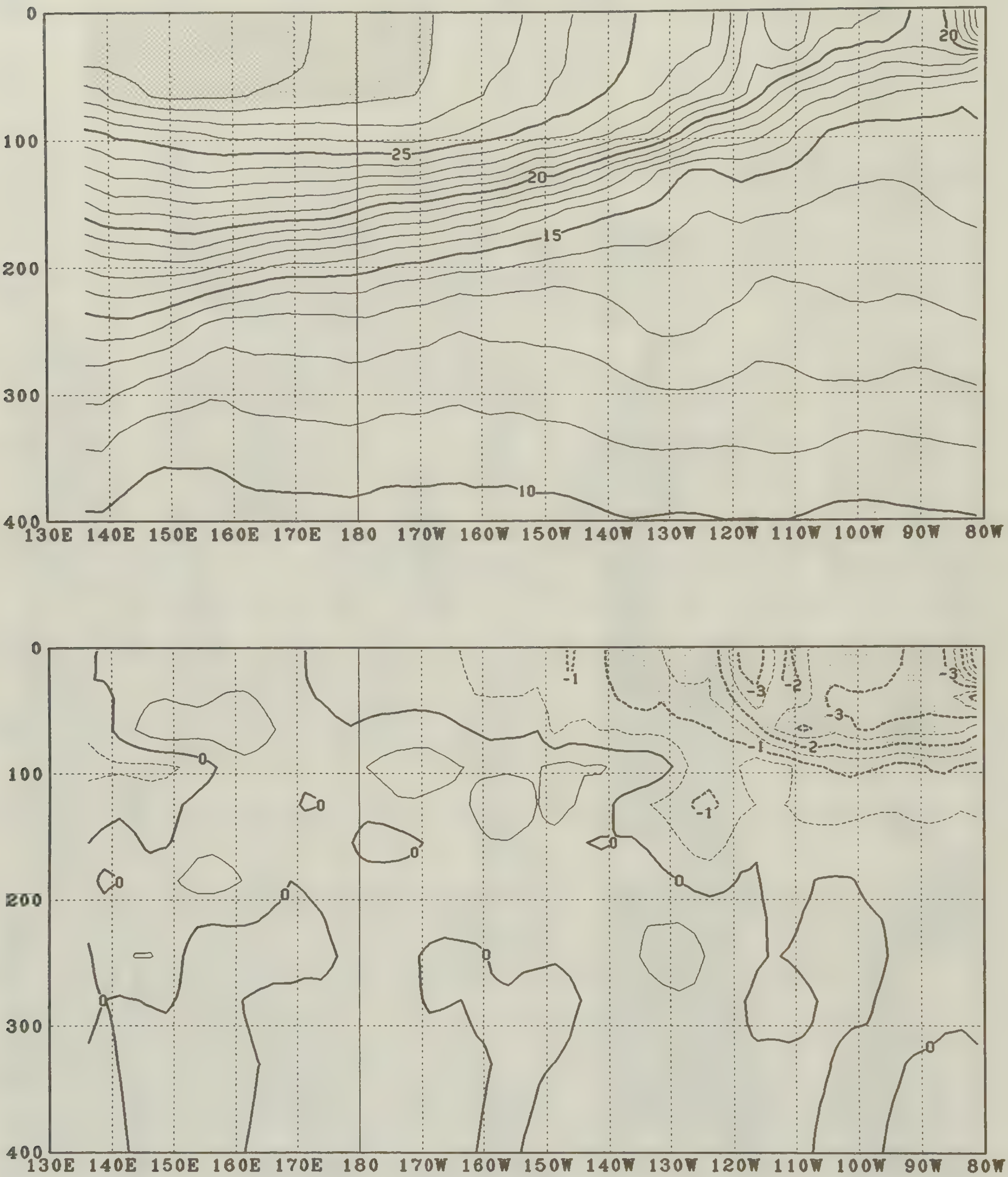
Depth of 20° C & Anomalies in the Pacific Ocean



第8図　太平洋表層水温（20℃深度）図（上）及び偏差図（下）（1995年 6月）

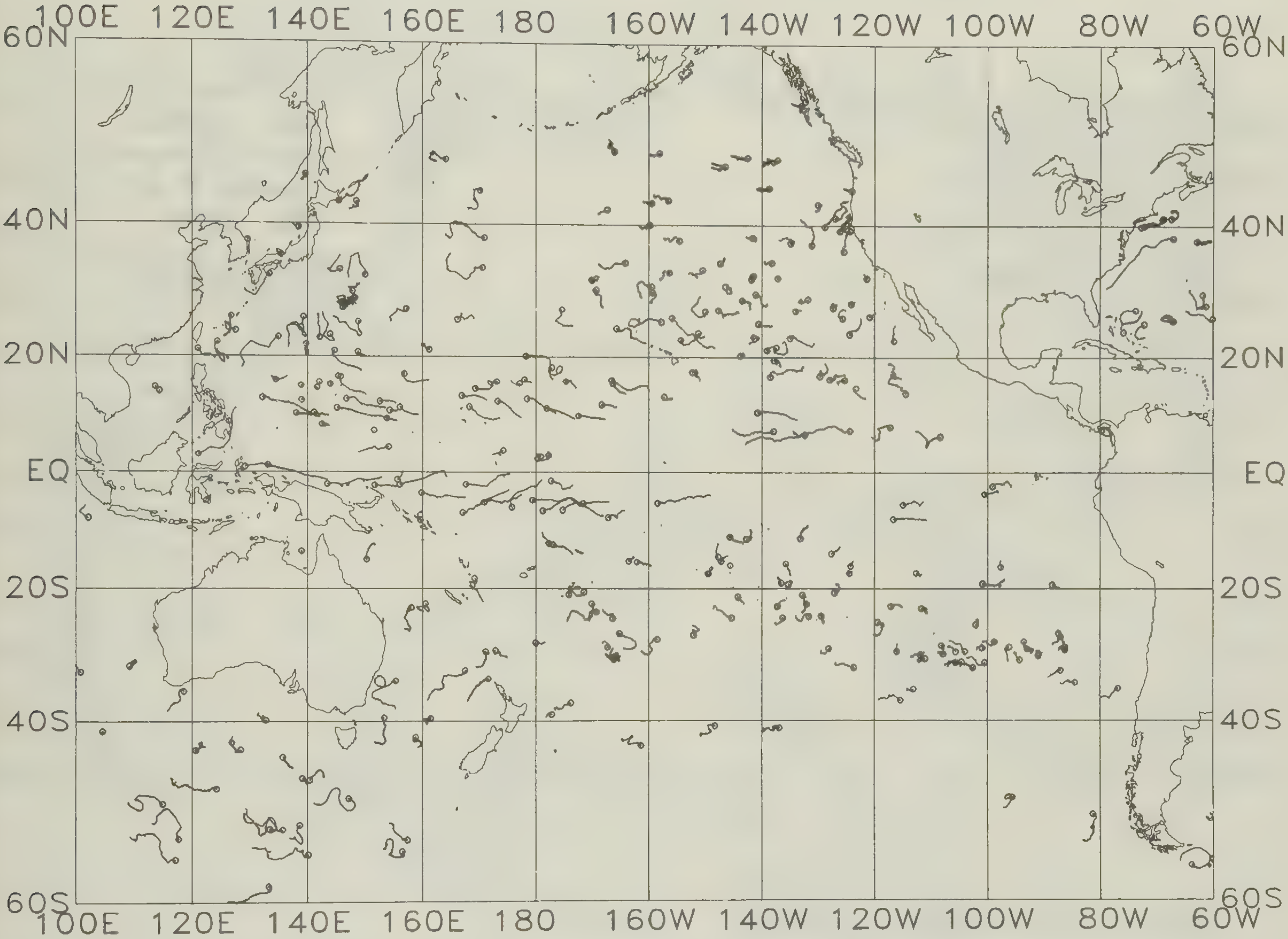
Fig.8 Depth of the 20° C isotherm in the Pacific Ocean (top) and anomalies (bottom) for JUN 1995. Anomalies are computed from the climatology (Levitus, 1982, Climatological Atlas of the World Ocean, NOAA). Contour interval is 20m. Values greater than 160m in top panel are shaded. In bottom panel values greater than +40m are shaded and values less than −40m are spotted.

Depth−Longitude Section of Equatorial Temperature & Anomalies



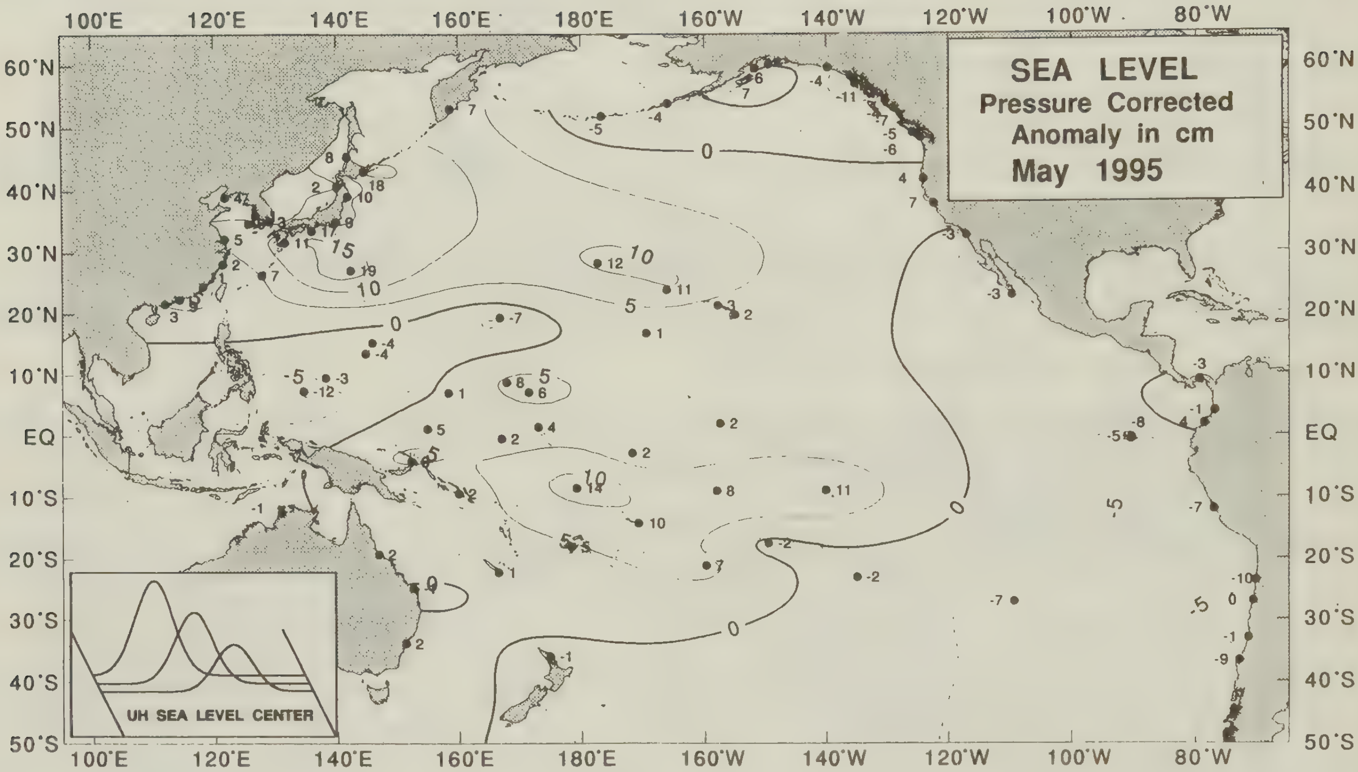
第9図　太平洋赤道に沿う表層水温（上）及び偏差（下）の深度ー経度断面図（1995年 6月）

Fig.9 Depth−longitude sections of temperature (top) and anomalies (bottom) along the equator in the Pacific Ocean for JUN 1995. Data are derived from the Ocean Data Assimilation System of JMA. Contour interval is 1° C (top) and 0.5° C (bottom). Values greater than 28° C in top panel are shaded. In bottom panel values greater than 1° C are shaded and values less than −1° C are spotted. Anomalies are computed from 1987−1994 base period means.



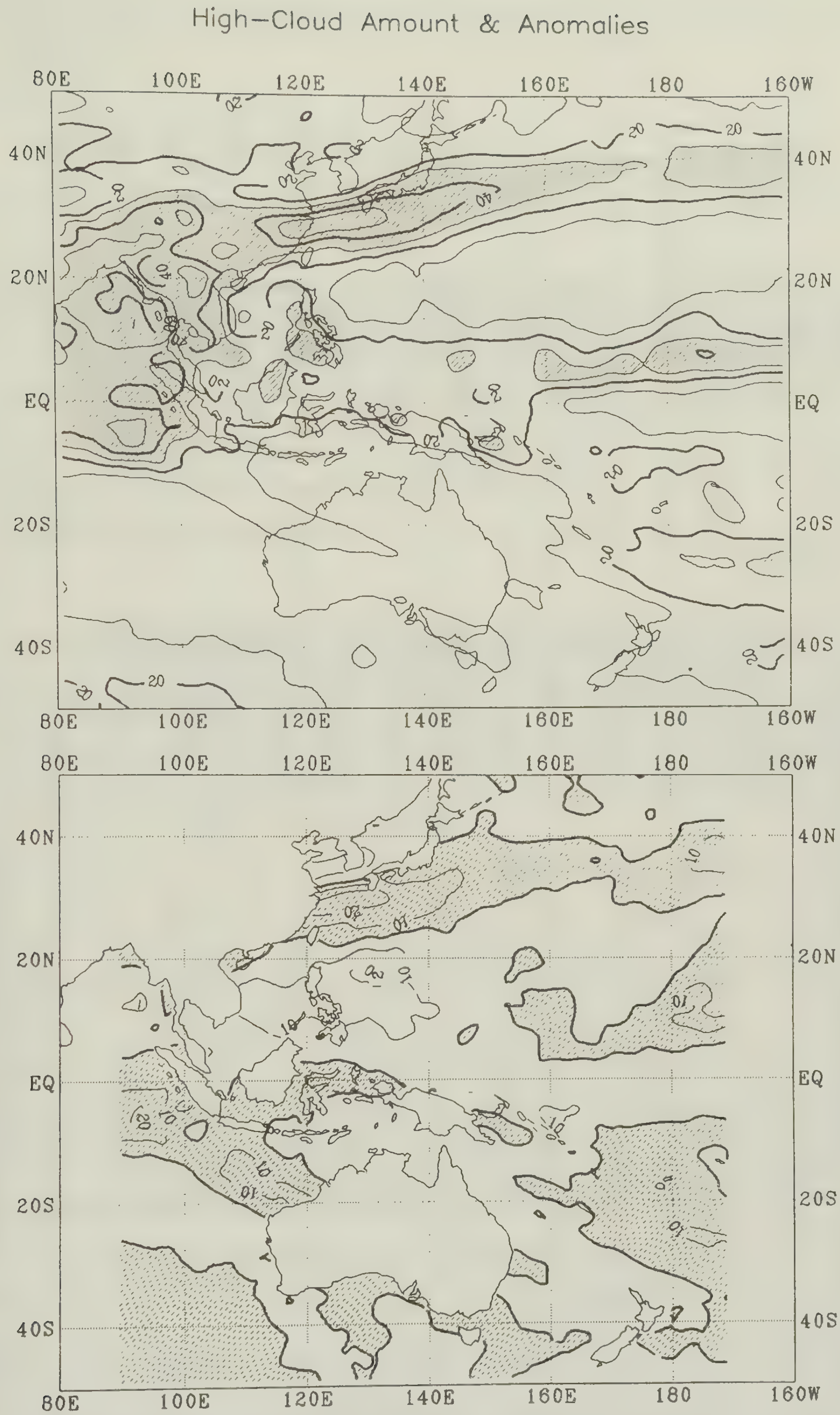
第10図　太平洋ブイ流跡図(1995年 6月)

Fig.10 Movements of drifting buoys in the Pacific Ocean during JUN 1995. Each track is for one buoy. Small circles represent last positions for the month.



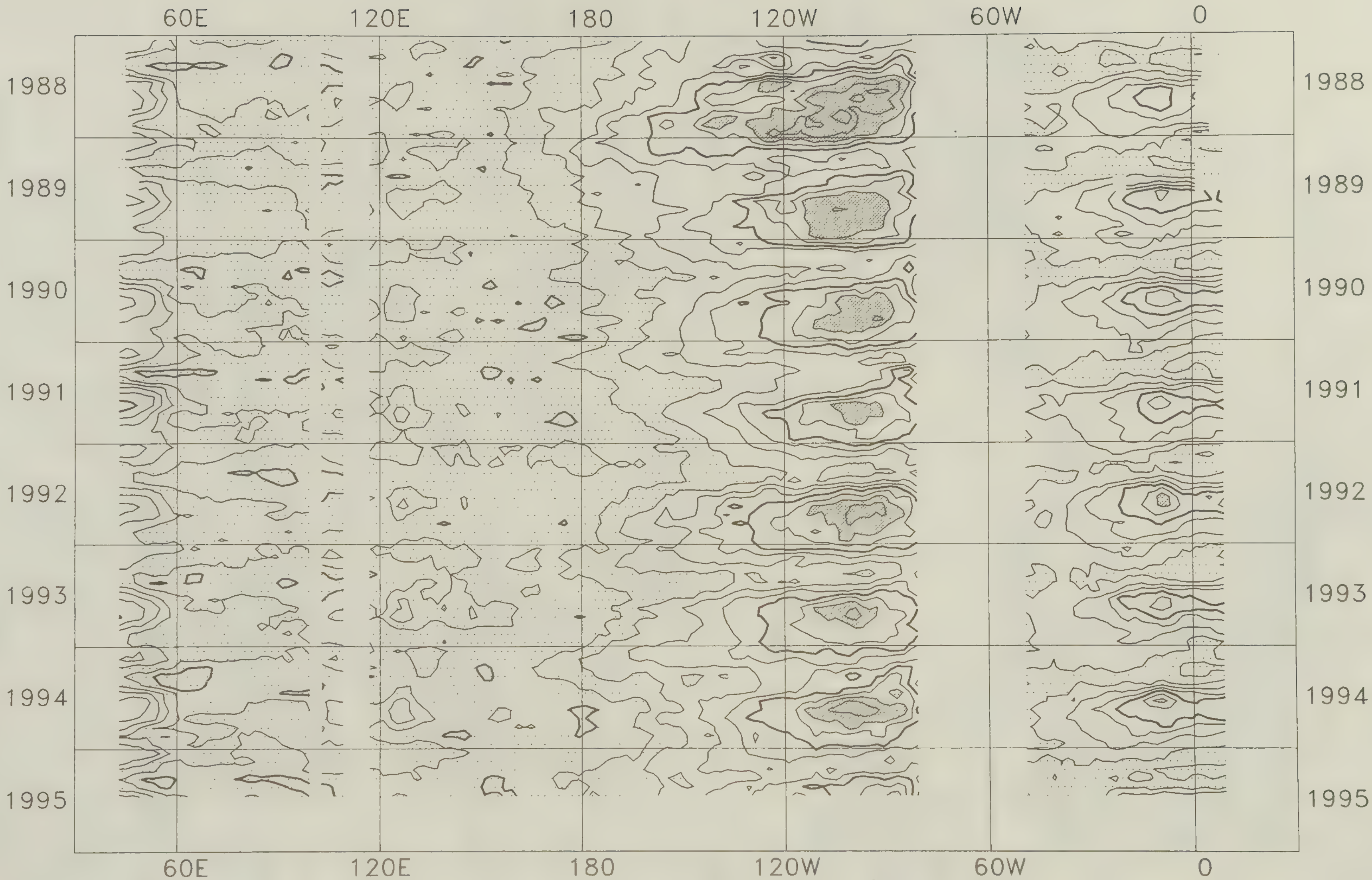
第11図　太平洋海面水位偏差図（ 1995年 5月 ）

Fig.11　Monthly sea level anomalies for MAY 1995 obtained from mean sea level (1975−1986) adjusted for atmospheric pressure.
This figure is prepared by the SOC of ISLP−PAC, Dept. of Oceanography, Univ. of Hawaii.



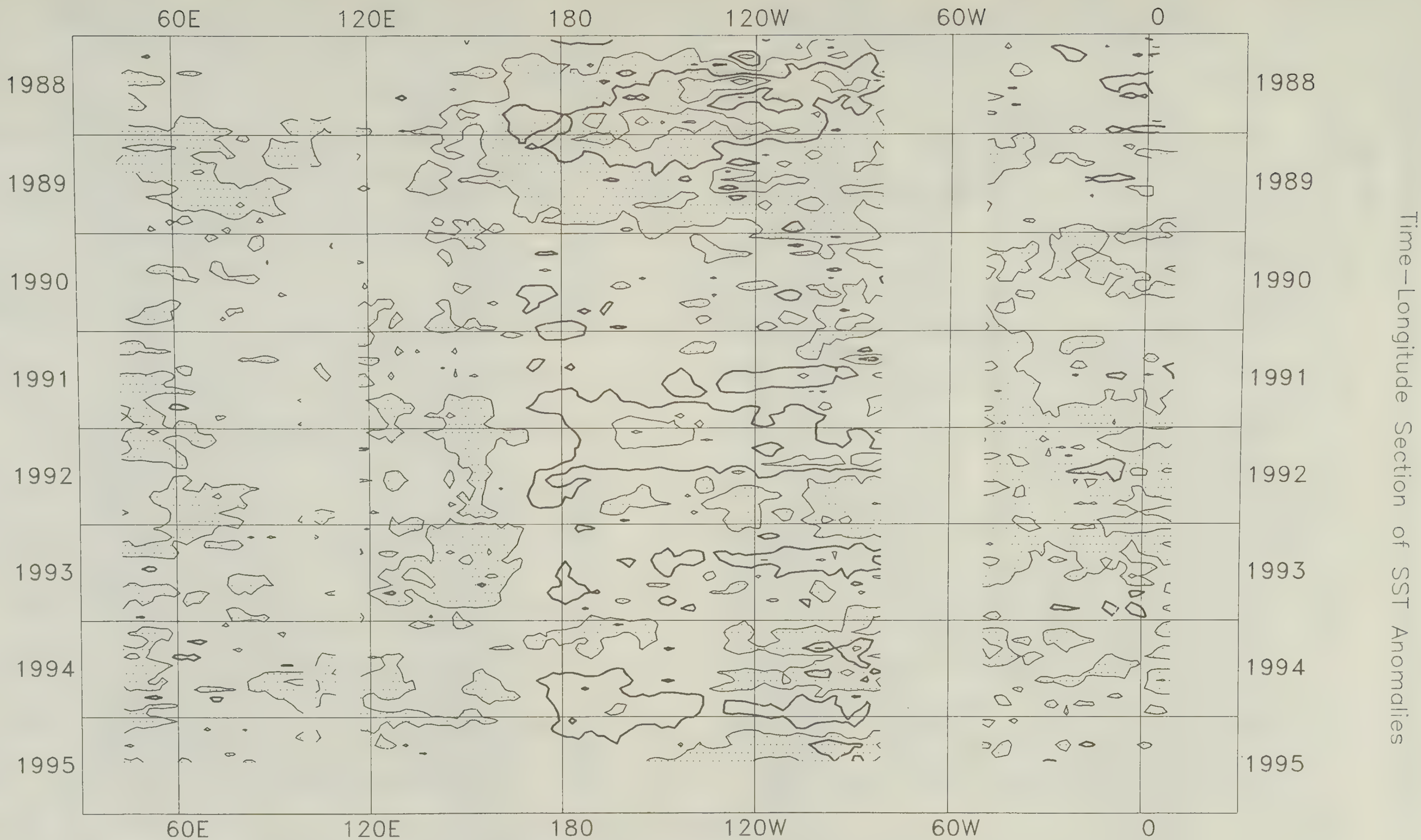
第12図　西太平洋月平均上層雲量分布図及び偏差図（1995年 6月）

Fig.12 Monthly mean of the high-cloud amount (%, top) and its anomalies (%, bottom) in the western Pacific for JUN 1995. Contour interval is 10%. Areas above 30% are shaded (top) and positive anomalies are stippled (bottom). Anomalies are computed from 1978-1990 base period means. Figures are prepared by the Long-range Forecast Division of JMA.



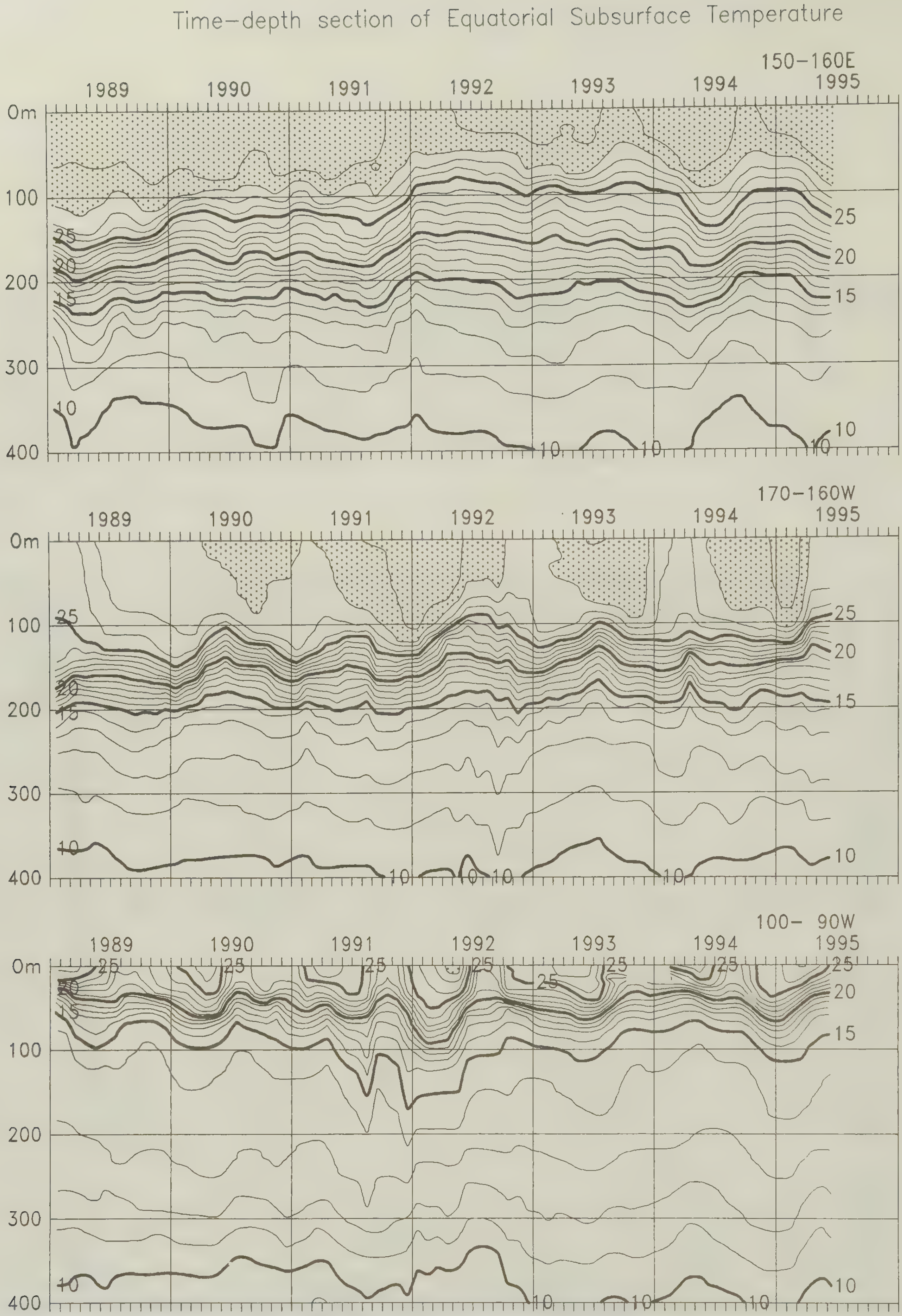
第13図　赤道に沿う海面水温の時間－経度断面図

Fig.13 Time-longitude section of SSTs along the equator (2° N-2° S) in the global ocean. Contour interval is 1° C, with thick contour lines at 25 and 30° C. SST values greater than 28° C are spotted and values less than 23° C are shaded.



第14図　赤道に沿う海面水温偏差の時間－経度断面図

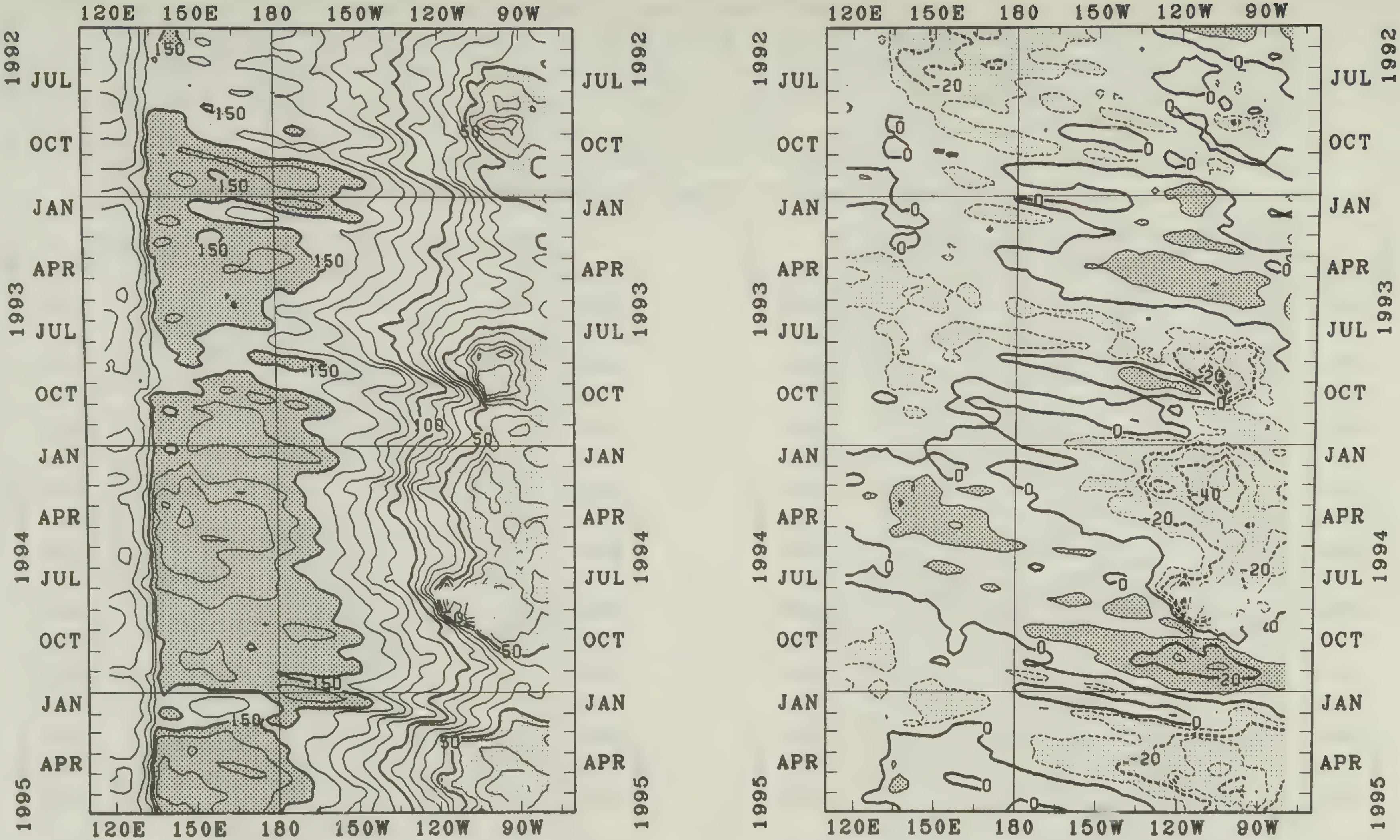
Fig.14 Time−longitude section of SST anomalies along the equator (2° N−2° S) computed from the JMA climatology (1961−1990). Contour interval is 1° C, with thick contour lines at +1° C and −1° C. Negative anomalies are spotted.



第15図　太平洋赤道域の表層水温の時間－深度断面図
（上：西部、中：中部、下：東部）

Fig.15 Time-depth section of equatorial (2° N–2° S) subsurface temperature for the western Pacific (top, 150–160° E), the central Pacific (middle, 170–160° W) and the eastern Pacific (bottom, 100–90° W). Contour interval is 1° C. Values greater than 28° C are shaded.

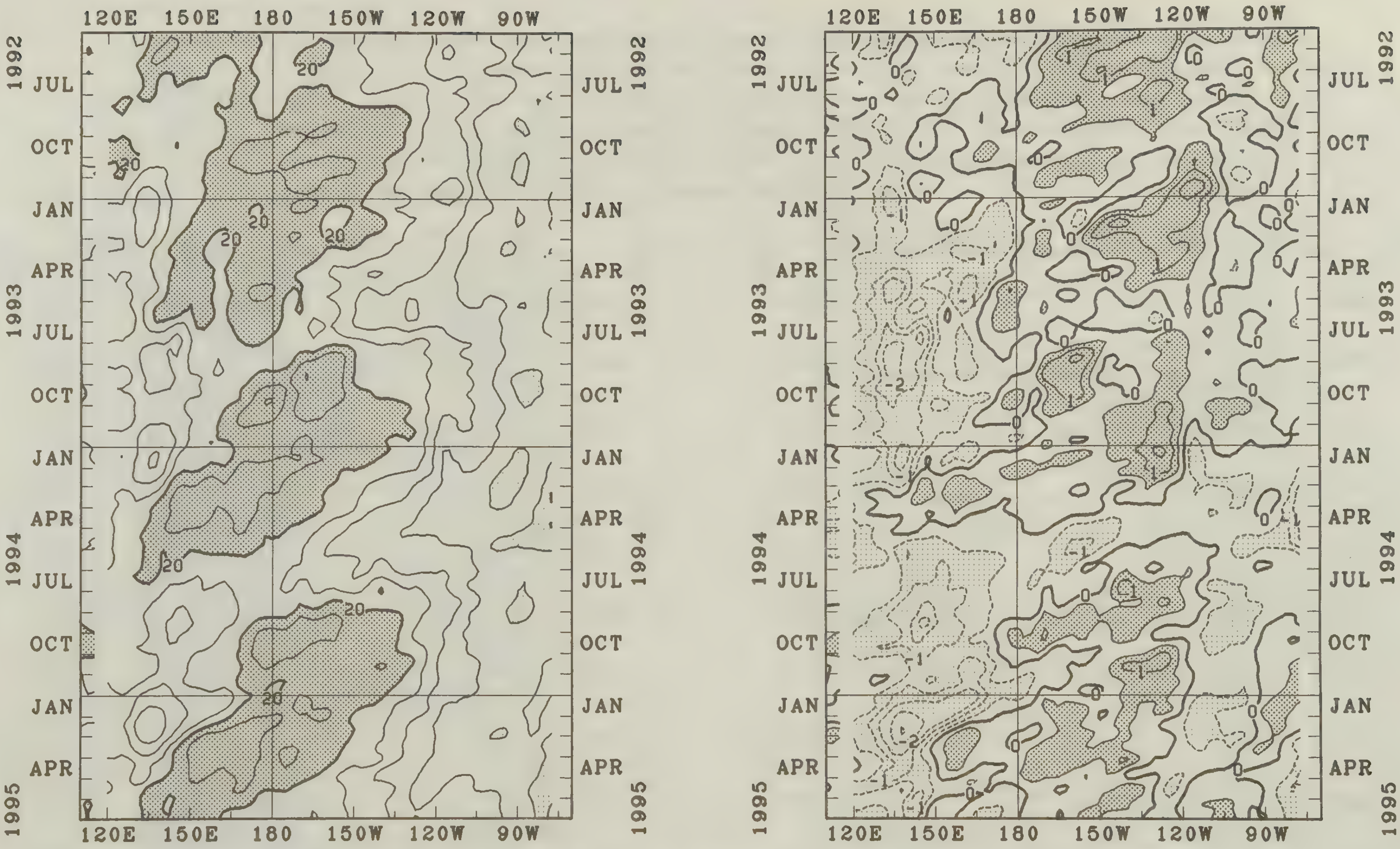
Time–Longitude Section of Depth of 20° C & Anomalies



第16図　太平洋の赤道に沿う20℃深度（左）及び偏差（右）の時間－経度断面図

Fig.16 Time–longitude sections of depth of the 20° C isotherm along the equator (left) and anomalies (right) in the Pacific Ocean. Data are derived from the Ocean Data Assimilation System of JMA. Contour interval is 10m. Values in left panel greater than 150m are shaded and values less than 50m are spotted. Dashed contours in right panel indicate negative anomalies. Anomalies are computed from 1987–1994 base period means.

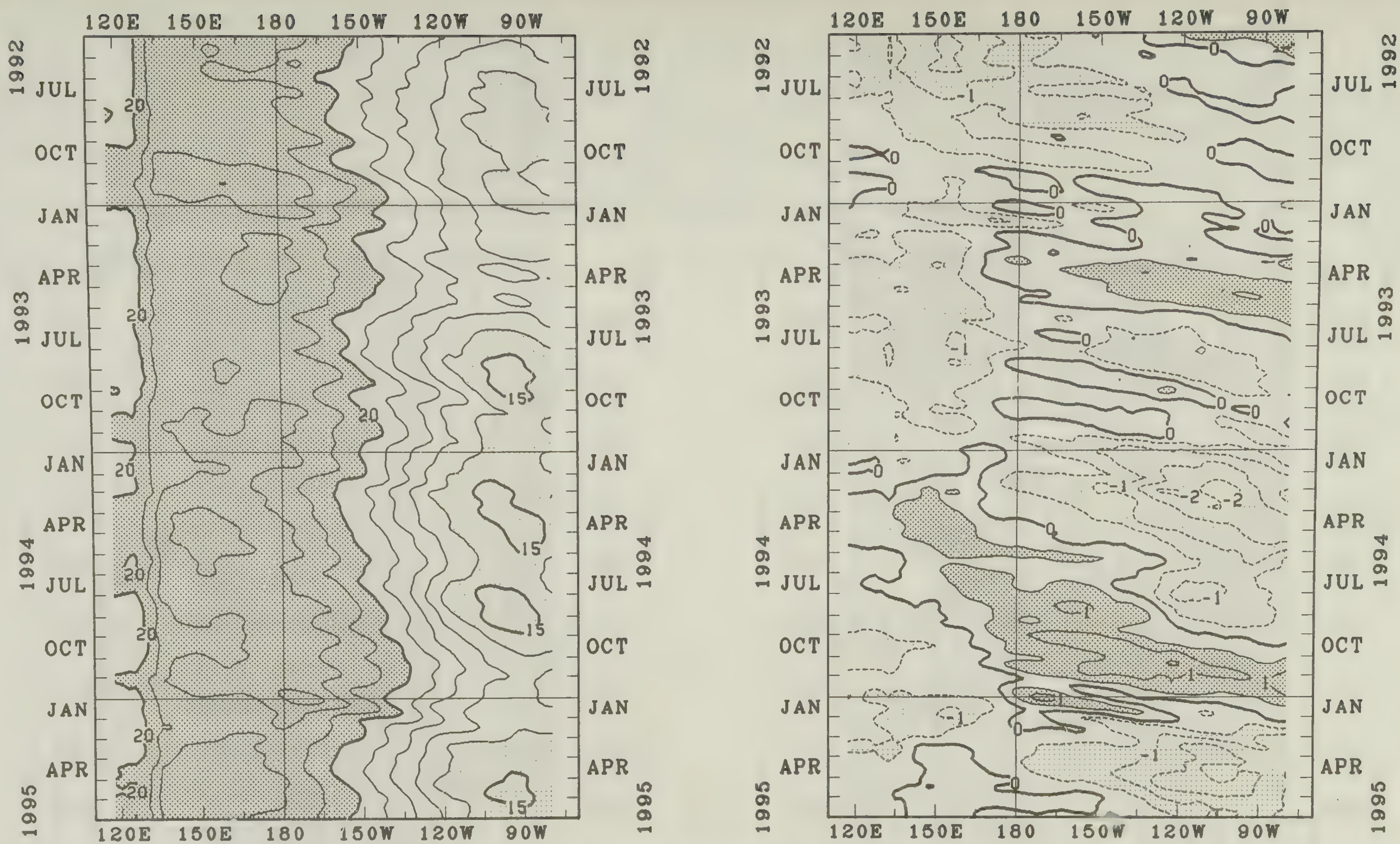
Time–Longitude Section of Ocean Heat Content & Anomalies (6° N)



第17図　太平洋の北緯6度線に沿う海洋表層の貯熱量（左）及び偏差（右）の時間－経度断面図

Fig.17 Time–longitude sections of ocean heat content in the upper 260m along 6° N (left) and anomalies (right) in the Pacific Ocean. Data are derived from an Ocean Data Assimilation System of JMA. Contour interval is 1° C (left) and 0.5° C (right). Values in the left panel greater than 20° C are shaded and values less than 16° C are spotted. Dashed contours in right panel indicate negative anomalies. Anomalies are computed from 1987–1994 base period means.

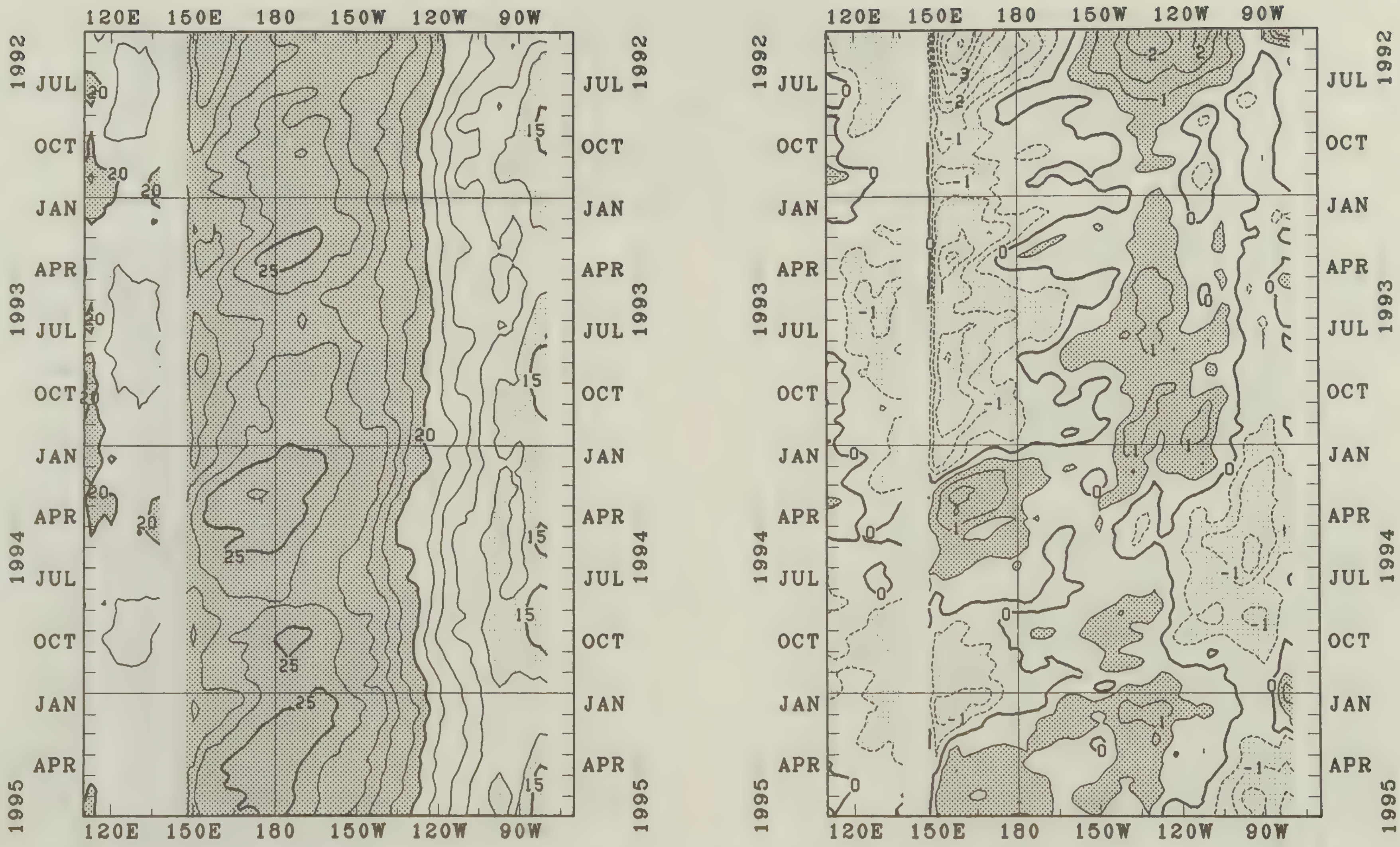
Time–Longitude Section of Ocean Heat Content & Anomalies (Eq.)



第18図　太平洋の赤道に沿う海洋表層の貯熱量（左）及び偏差（右）の時間－経度断面図

Fig.18 Time–longitude sections of ocean heat content in the upper 260m along the equator (left) and anomalies (right) in the Pacific Ocean. Data are derived from the Ocean Data Assimilation System of JMA. Contour interval is 1° C (left) and 0.5° C (right). Values in the left panel greater than 20° C are shaded and values less than 16° C are spotted. Dashed contours in right panel indicate negative anomalies. Anomalies are computed from 1987–1994 base period means.

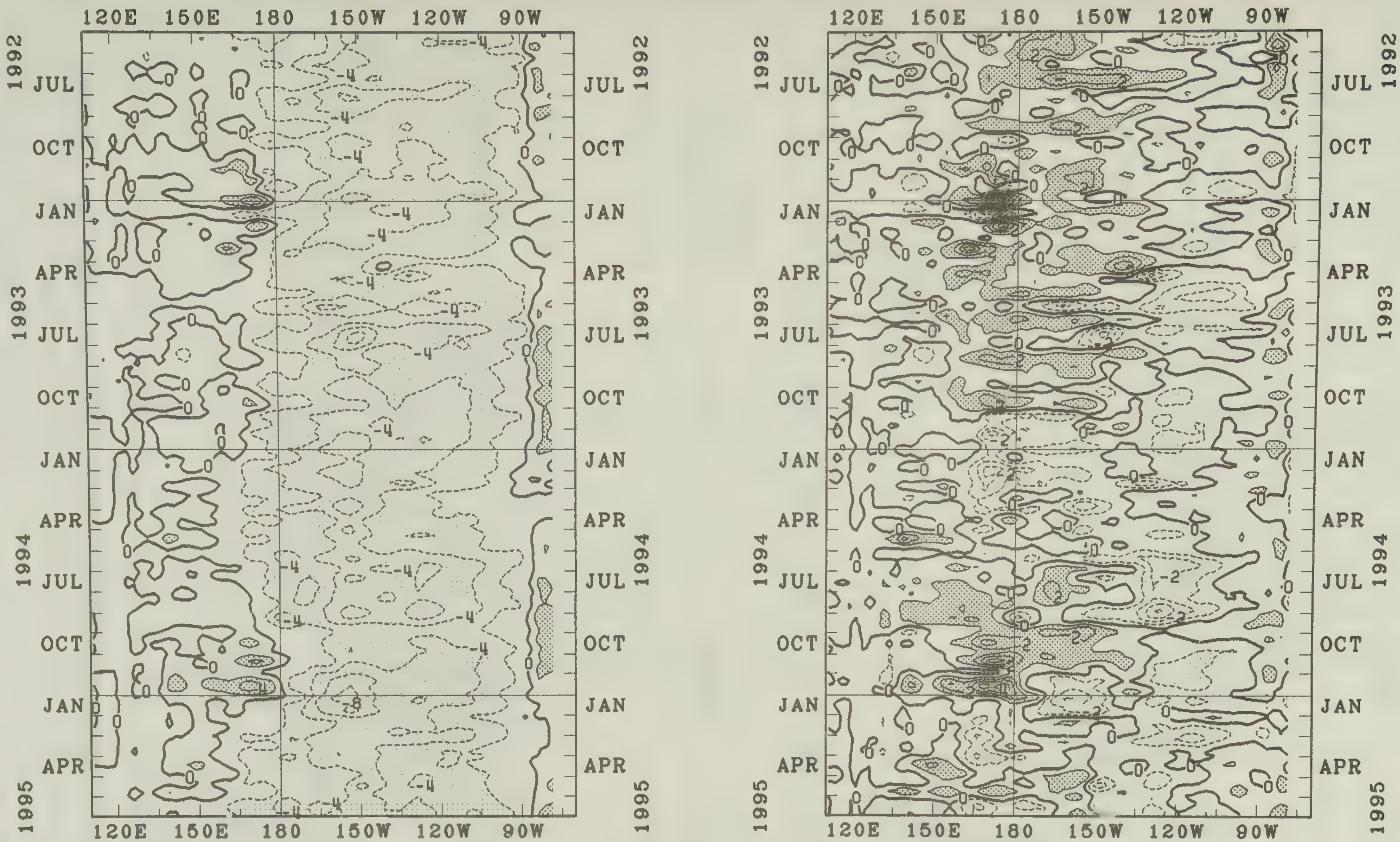
Time–Longitude Section of Ocean Heat Content & Anomalies (6° S)



第19図　太平洋の南緯6度線に沿う海洋表層の貯熱量（左）及び偏差（右）の時間－経度断面図

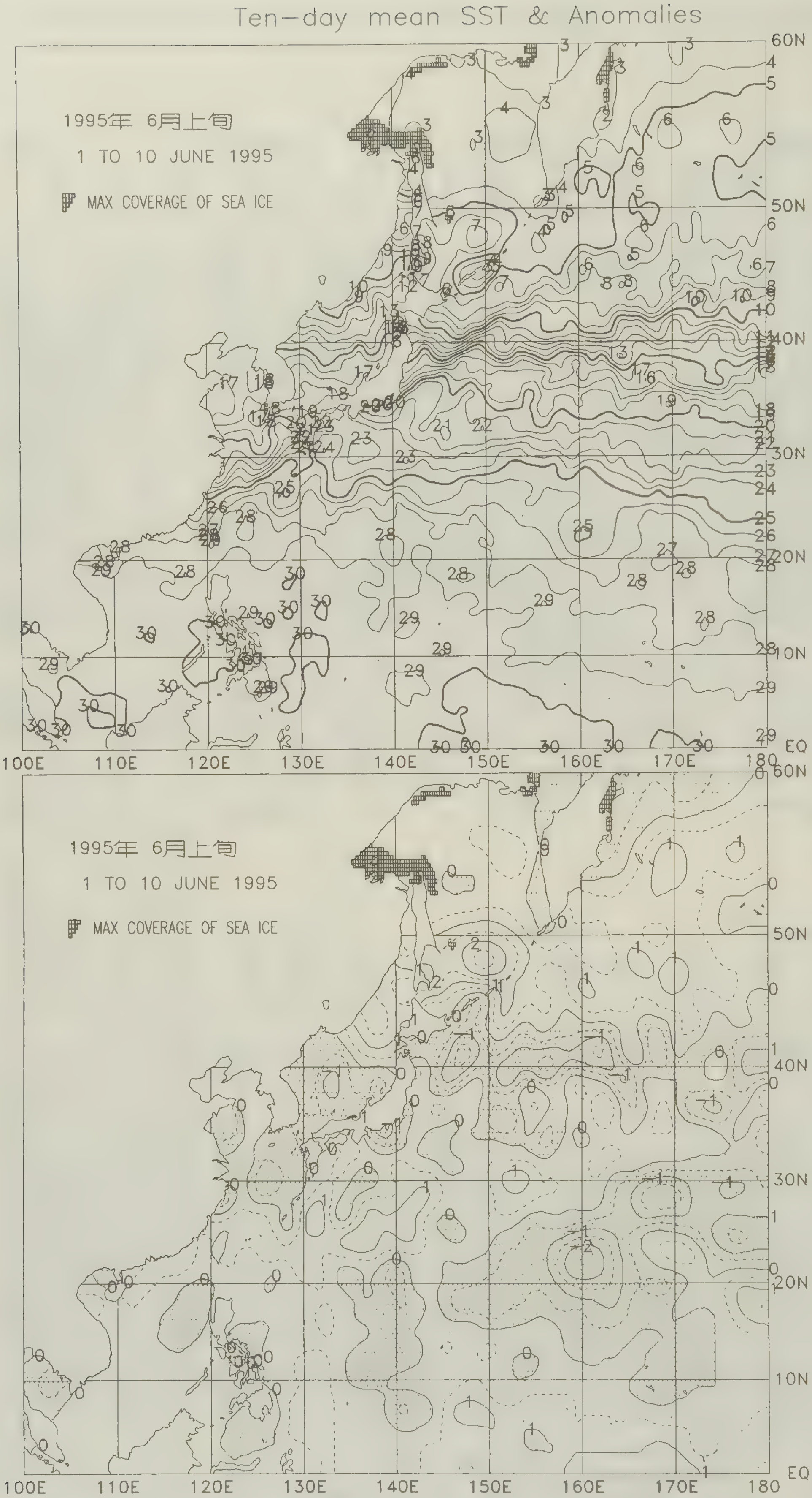
Fig.19 Time–longitude sections of ocean heat content in the upper 260m along 6° S (left) and anomalies (right) in the Pacific Ocean. Data are derived from the Ocean Data Assimilation System of JMA. Contour interval is 1° C (left) and 0.5° C (right) Values in the left panel greater than 20° C are shaded and values less than 16° C are spotted. Dashed contours in right panel indicate negative anomalies. Anomalies are computed from 1987–1994 base period means.

Time-Longitude Section of Surface Zonal Wind Stress & Anomalies



第20図　太平洋の赤道に沿う海面の風応力の東西成分（左）及び偏差（右）の時間－経度断面図

Fig.20 Time-longitude sections of surface zonal wind stress along the equator (left) and anomalies (right) in the Pacific Ocean. Data are derived from the Atmospheric Global Data Assimilation System of JMA. Contour interval is 0.02N/m2 (left) and 0.01N/m2 (right). Dashed contours indicate easterlies (left) and easterly anomalies (right). Anomalies are computed from 1987-1994 base period means.



旬平均沿岸水温(℃)
Coastal Water Temperature

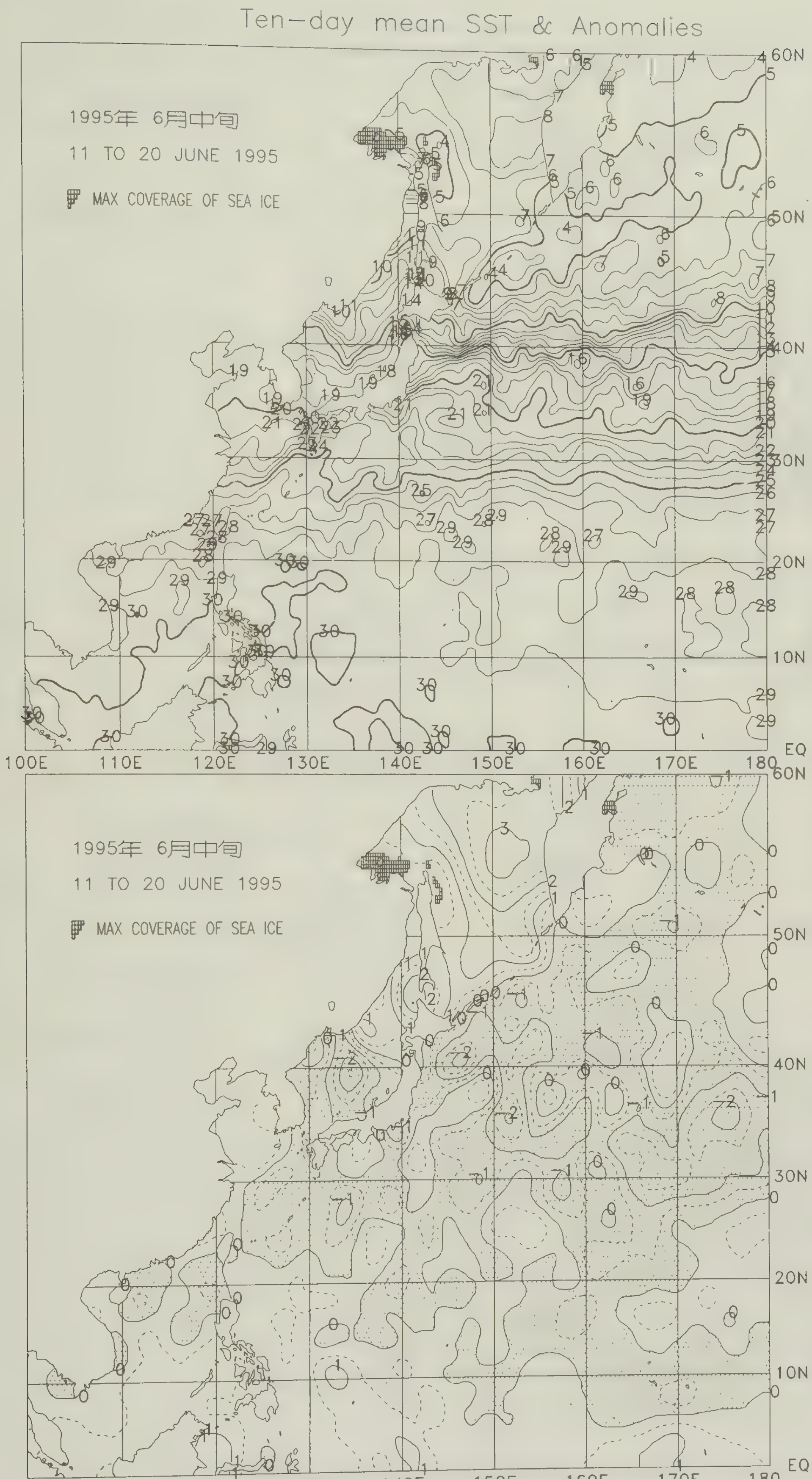
地点名 (Index Number)	水温 Temp.	偏差 Anom.
石垣島(47918)	27.6	+0.7
御前崎(47655)	19.8	−1.0
八丈島(47678)	20.1	−2.0
小名浜(47598)	15.7	+1.3
宮　古(47585)	11.3	−0.1
江　差(47428)	13.8	−
浜　田(47755)	19.4	−

海洋気象ブイロボット
旬平均海面水温(℃)
Ocean Data Buoy SST

日本海	37.9N,134.5E	15.8
四国沖	29.0N,135.0E	23.3
東シナ海	28.2N,126.3E	−9.7

第21図 北西太平洋旬平均海面水温図(上)及び偏差図(下)(1995年 6月上旬)

Fig.21 Ten−day mean SSTs in the western North Pacific (top) and anomalies (bottom) for the 1st ten−day period in JUN 1995. Anomalies are computed from the JMA climatology (1961−90). Contour interval is 1° C and additional anomaly contours of 0.5° C are shown as broken lines. Negative anomalies are spotted.



旬平均沿岸水温(℃)
Coastal Water Temperature

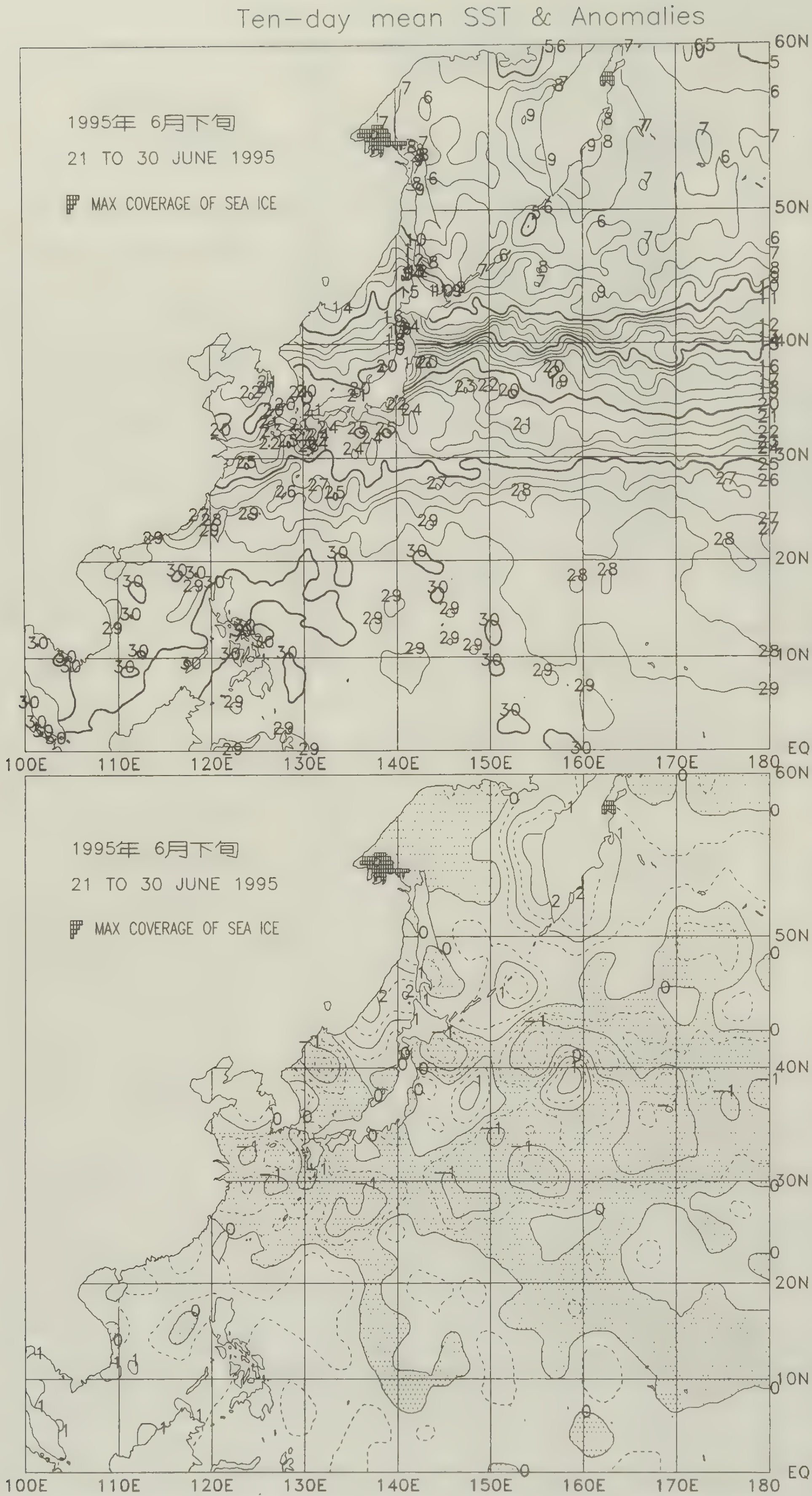
地点名 (Index Number)	水温 Temp.	偏差 Anom
石垣島(47918)	27.3	−0.4
御前崎(47655)	20.2	−1.2
八丈島(47678)	18.9	−3.9
小名浜(47598)	16.4	+1.9
宮古(47585)	13.6	+1.2
江差(47428)	15.2	−
浜田(47755)	19.7	−

海洋気象ブイロボット
旬平均海面水温(℃)
Ocean Data Buoy SST

日本海	37.9N,134.5E	16.9
四国沖	29.0N,135.0E	23.2
東シナ海	28.2N,126.3E	−

第22図 北西太平洋旬平均海面水温図(上)及び偏差図(下)(1995年 6月中旬)

Fig.22 Ten-day mean SSTs in the western North Pacific (top) and anomalies (bottom) for the 2nd ten-day period in JUN 1995. Anomalies are computed from the JMA climatology (1961−90). Contour interval is 1°C and additional anomaly contours of 0.5°C are shown as broken lines. Negative anomalies are spotted.



旬平均沿岸水温(℃)
Coastal Water Temperature

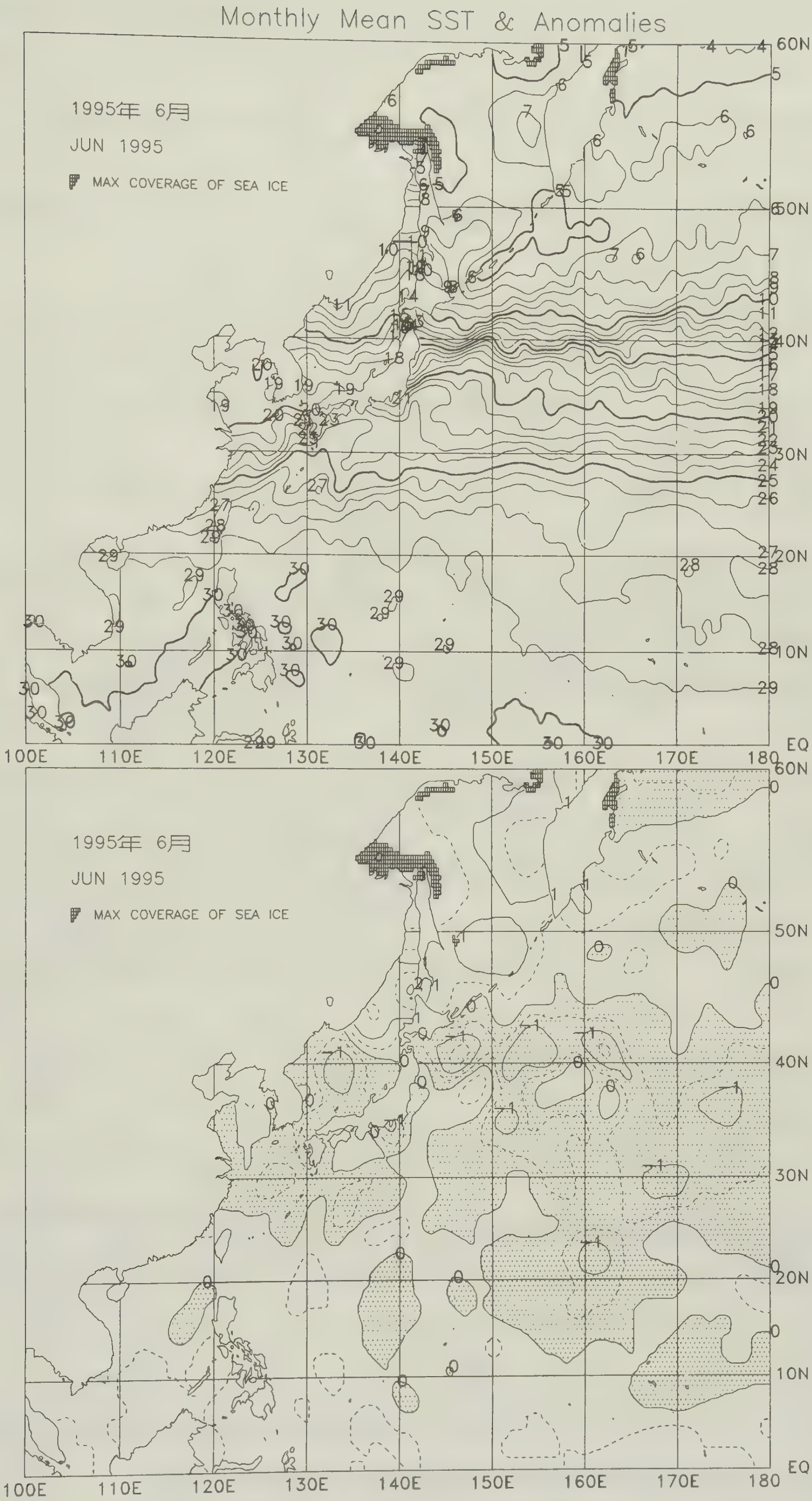
地点名 (Index Number)	水温 Temp.	偏差 Anom.
石垣島(47918)	28.6	+0.1
御前崎(47655)	21.2	−0.7
八丈島(47678)	21.3	−2.2
小名浜(47598)	17.0	+1.4
宮古(47585)	14.2	+0.7
江差(47428)	15.4	−
浜田(47755)	20.9	−

海洋気象ブイロボット
旬平均海面水温(℃)
Ocean Data Buoy SST

日本海	37.9N,134.5E	18.5
四国沖	29.0N,135.0E	24.4
東シナ海	28.2N,126.3E	−

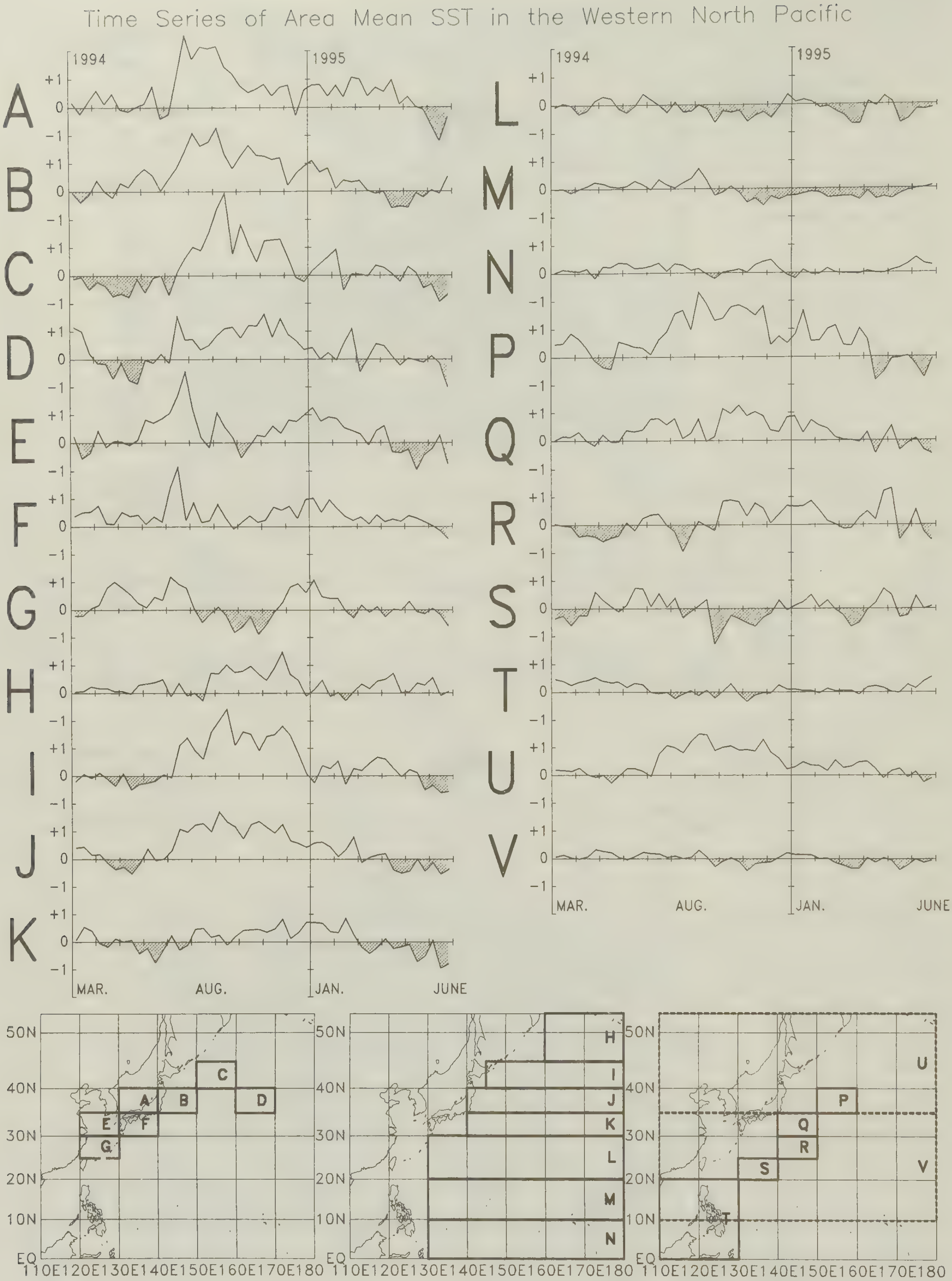
第23図 北西太平洋旬平均海面水温図(上)及び偏差図(下)(1995年 6月下旬)

Fig.23 Ten-day mean SSTs in the western North Pacific (top) and anomalies (bottom) for the 3rd ten-day period in JUN 1995. Anomalies are computed from the JMA climatology (1961−90). Contour interval is 1°C and additional anomaly contours of 0.5°C are shown as broken lines. Negative anomalies are spotted.



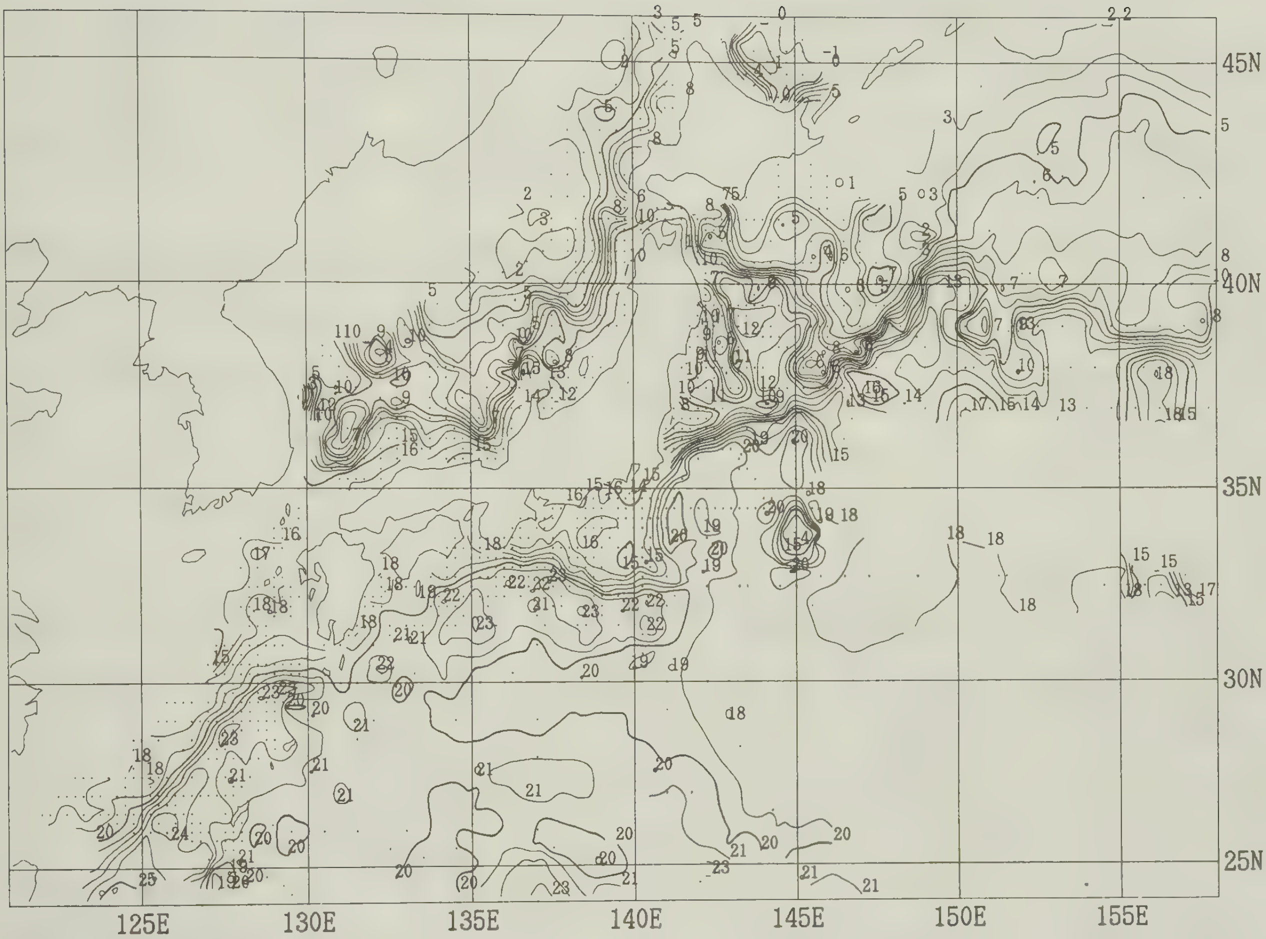
第24図 北西太平洋月平均海面水温図(上)及び偏差図(下)(1995年 6月)

Fig.24 Monthly mean SSTs in the western North Pacific (top) and anomalies (bottom) for JUN 1995. Anomalies are computed from the JMA climatology (1961–1990). Contour interval is 1° C and additional anomaly contours of 0.5° C are shown as broken lines. Negative anomalies are spotted.



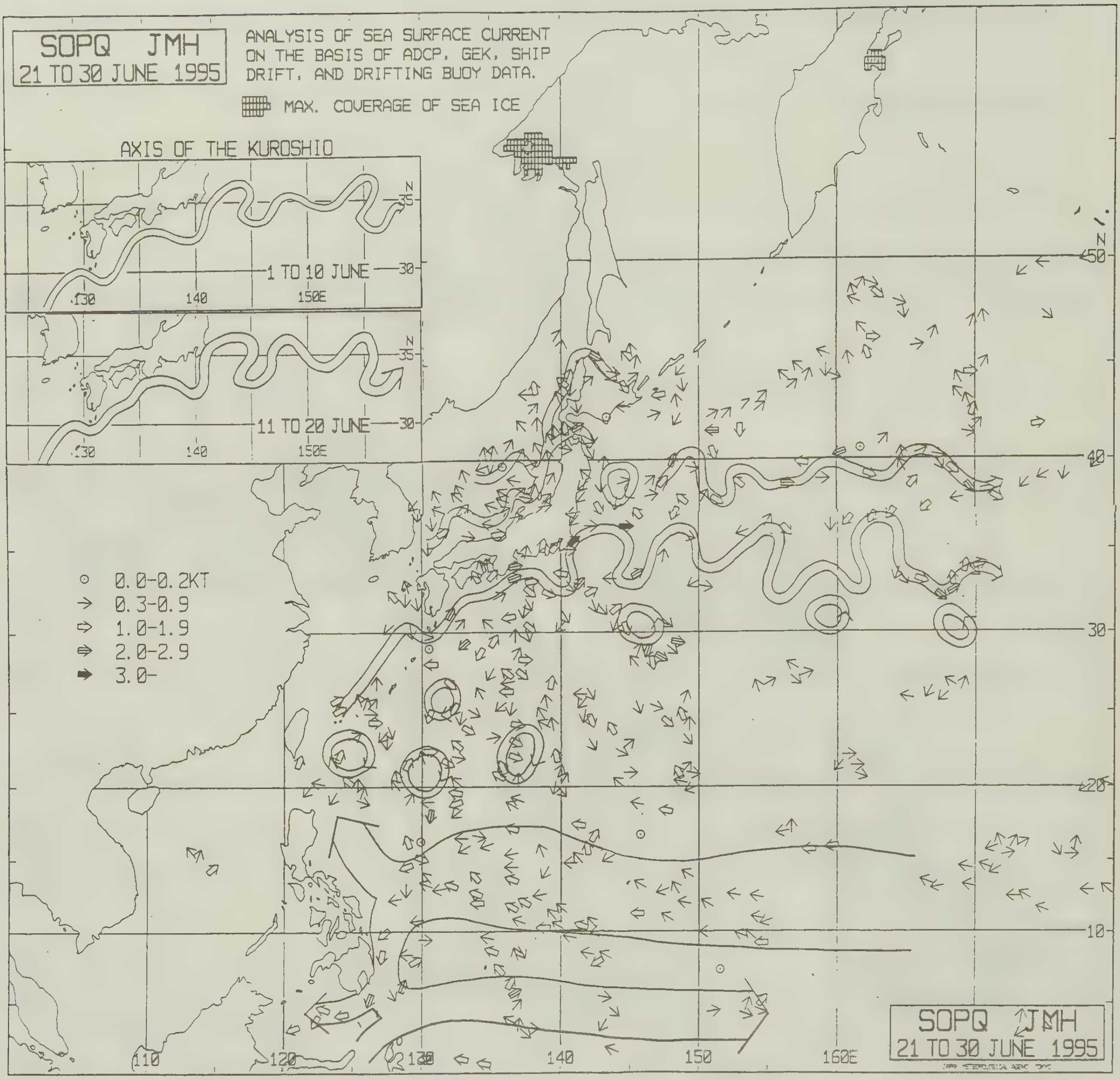
第25図　北西太平洋旬平均海面水温平年偏差時系列図

Fig.25 Time series of the ten-day mean sea surface temperature anomalies (° C) in the western North Pacific for the areas indicated at the bottom. Negative anomalies are shaded. Anomalies are computed from the JMA climatology (1961−90).



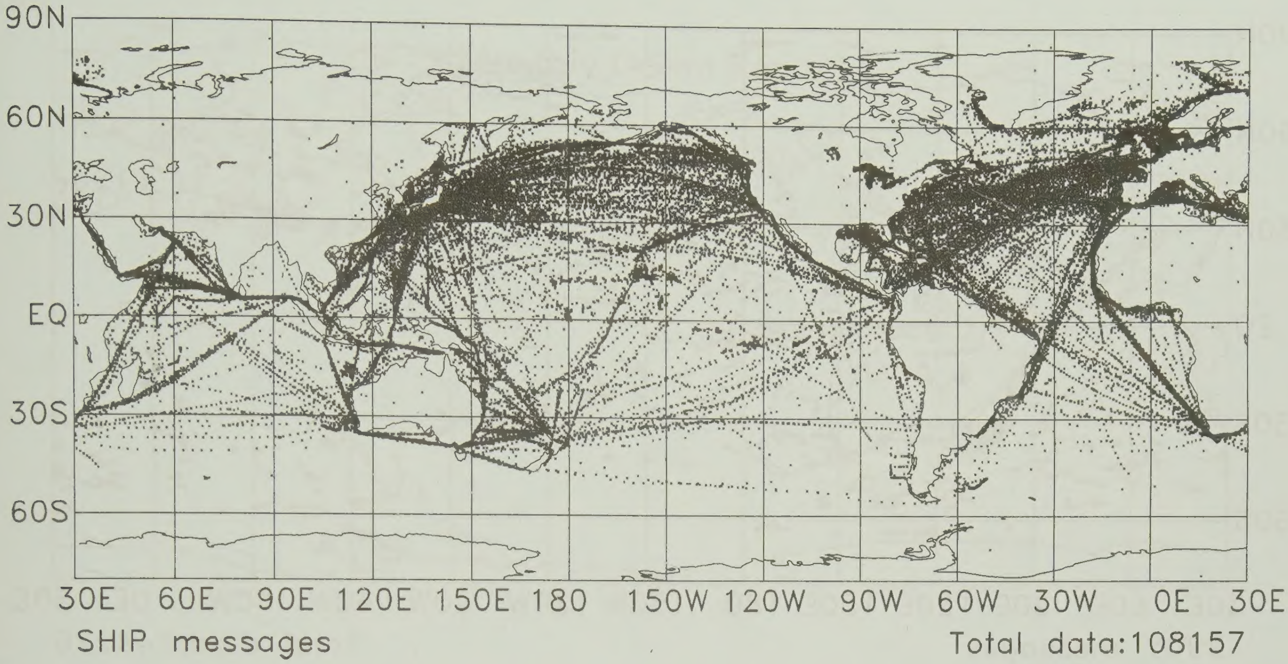
第26図　日本近海表層水温(深さ100m)図（1995年 6月）

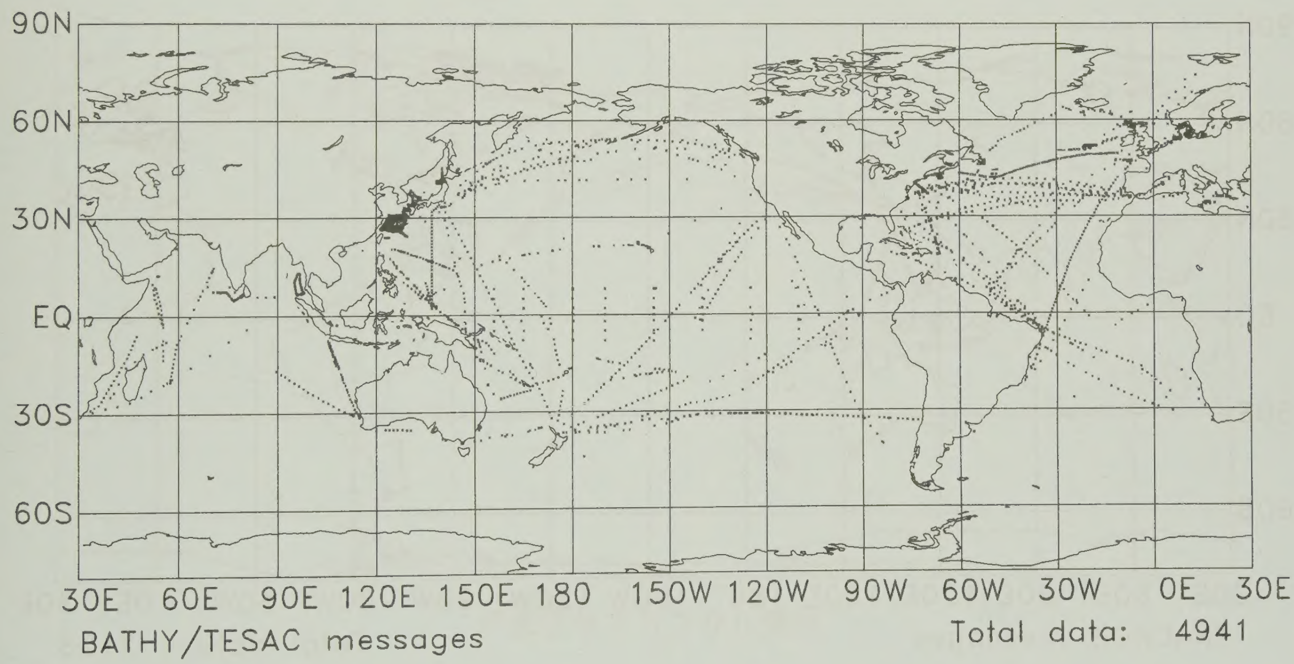
Fig.26　Subsurface (100m) temperatures in seas adjacent to Japan for JUN 1995. Contour interval is 1° C.　Observation points are denoted by dots.



第27図　北西太平洋海流図（1995年 6月下旬）

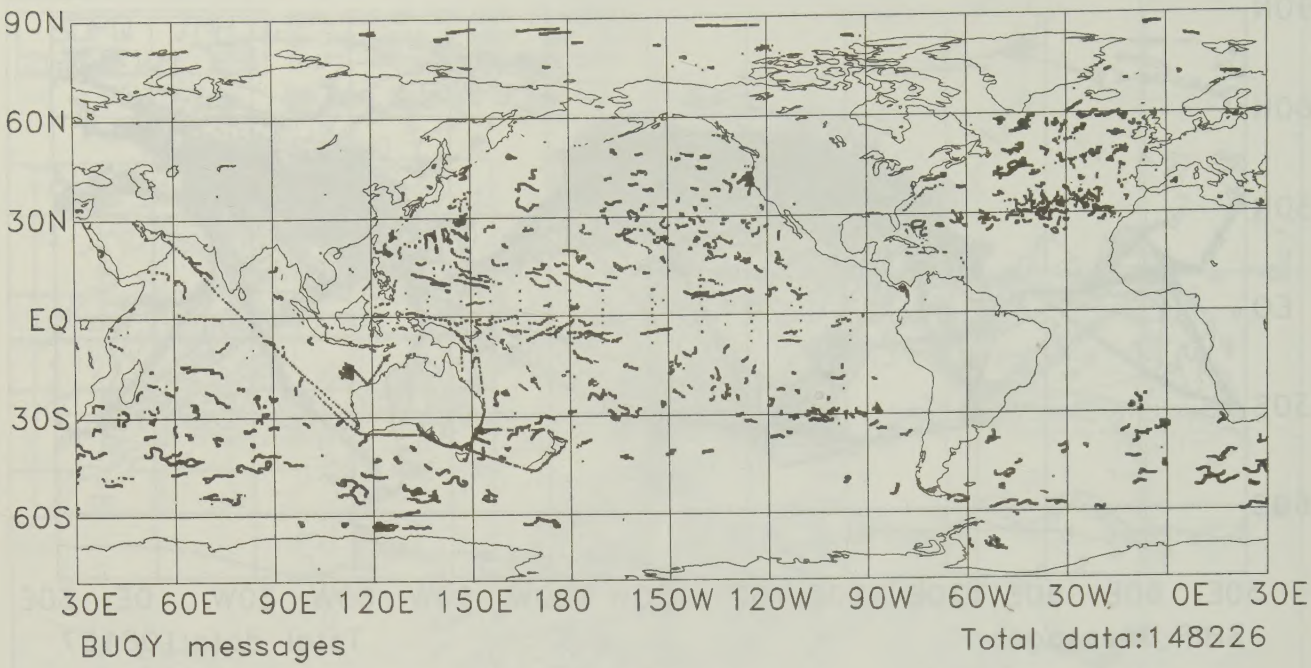
Fig.27 Analysis of the sea surface current in the western North Pacific for the 3rd ten-day period in JUN 1995. Small arrows indicate sea surface currents measured with acoustic Doppler current profilers, GEKs deployed in research vessels, and ship drift by merchant ships/drifting buoys during the month. Major currents such as the Kuroshio and the North Equatorial Current are denoted by larger open arrows.

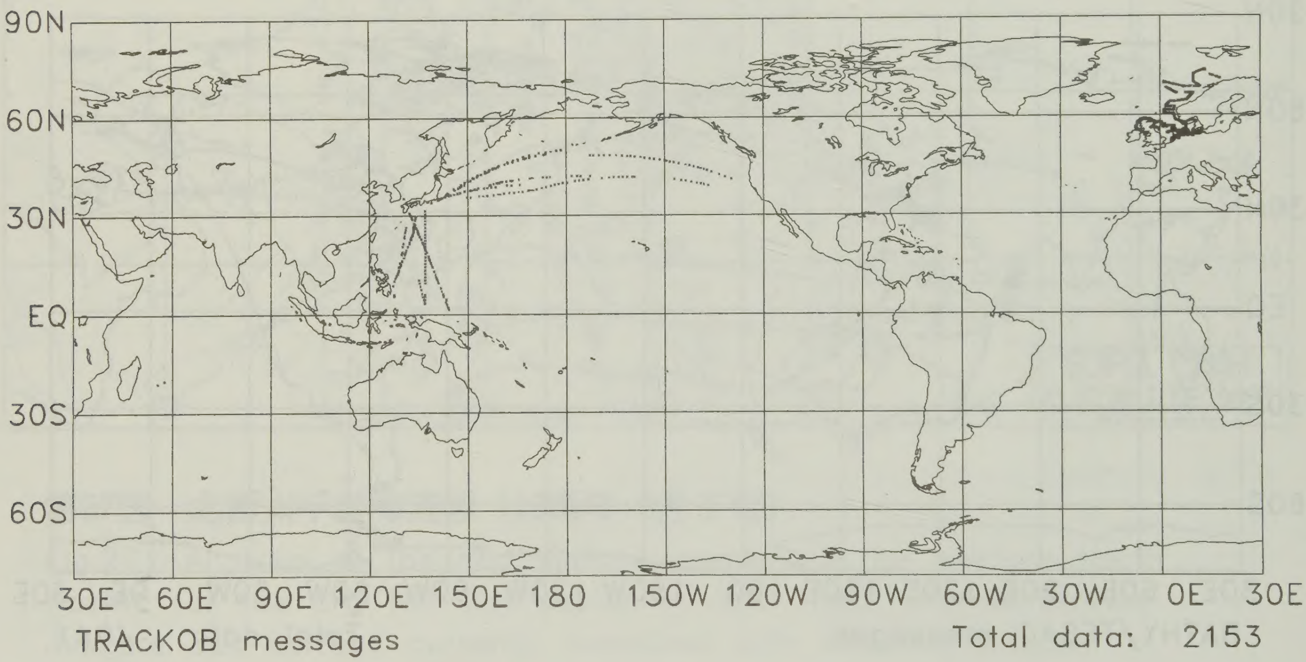




第28-1図 測点分布図(1995年 6月)

Fig.28-1 Geographical distribution of SHIP messages (SST data, top) and BATHY/TESAC messages (subsurface temperature data, bottom) for JUN 1995.





第28-2図　測点分布図(1995年 6月)

Fig.28-2 Geographical distribution of BUOY messages (buoy drift and SST data, top) and TRACKOB messages (ship drift and SST data, bottom) for JUN 1995.

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